STAT

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"HARDWARE" TYPE CONTRACT

1. Contract Number FH-2515 Task Order No. (If Any) ________

2. Financial Status as of 10/26/69 (Date)

3. Contract Performance Period From ________ To ________

4. Estimated Percentage of Work Completed 98.4%

5. Estimated Contract Completion Date ________

6. Contractor Planned Cumulative Expenditures to Date 1,763,630

7. Cumulative Actual Expenditures to Date 1,764,960

8. Contractor Planned Outstanding Commitments ——

9. Actual Outstanding Commitments ——

10. Cumulative Planned Expenditures and Outstanding Commitments to Date (6 + 8) 1,763,630

11. Cumulative Actual Expenditures and Outstanding Commitments to Date (7 + 9) 1,764,960

12. Variance - Lines 10 - 11 (+ or -) —1,330

13. Estimate to Complete Contract 27,160

14. Total Estimated Amount Required to Perform Contract (7 + 13) 1,792,120

15. Contract Funds Allocated 1,732,288

16. Variance - Lines 15 - 14 (+ or -) (59,832)

17. Additional Amount for Work Proposed, But not yet Authorized ——

25 YEAR RE-REVIEW

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25X1

CONTRACTOR MONTHLY FINANCIAL REPORT

"HARDWARE" TYPE CONTRACT

1. Contract Number FH-2515 Task Order No. (If Any) ________

2. Financial Status as of 9/28/69 (Date)

3. Contract Performance Period From --- To ---

4.	Estimated Percentage of Work Completed	98.4%
5.	Estimated Contract Completion Date	----
6.	Contractor Planned Cumulative Expenditures to Date	1,763,632
7.	Cumulative Actual Expenditures to Date	1,764,962
8.	Contractor Planned Outstanding Commitments	----
9.	Actual Outstanding Commitments	----
10.	Cumulative Planned Expenditures and Outstanding Commitments to Date (6 + 8)	1,763,632
11.	Cumulative Actual Expenditures and Outstanding Commitments to Date (7 + 9)	1,764,962
12.	Variance - Lines 10 - 11 (+ or -)	(1,330)
13.	Estimate to Complete Contract	27,160
14.	Total Estimated Amount Required to Perform Contract (7 + 13)	1,792,122
15.	Contract Funds Allocated	1,732,288*
16.	Variance - Lines 15 - 14 (+ or -)	(59,834)
17.	Additional Amount for Work Proposed, But not yet Authorized	

*Includes fee

25X1

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1.	FH-2515	FH-2510	AG-1102	AG-1101	
				Study	Production
2.	8/31/69	No	9/7/69	9/7/69	
3.	-	change	-	-	-
4.	98.4%	in	1%	16.8%	1%
5.	-	status	-	-	-
6.	$1,763,631		$ 2,508	$17,813	$1,359
7.	$1,764,961	since	$ 2,508	$16,557	$2,039
8.	-	prior	-	-	-
9.	-		-	-	-
10.	$1,763,631	report	$ 2,508	$17,813	$1,359
11.	$1,764,961		$ 2,508	$16,557	$2,039
12.	$- 1,330		-	$ 1,296	($ 680)
13.	$ 27,160		$ 222,406	$82,138	$194,687
14.	$1,792,121		$ 224,914	$98,695	$196,726
15.	$1,732,288		$ 224,914	$84,746	$210,675
16.	$- 59,833		-	($13,949)	$ 13,949
	(cost including fee)		(cost excluding fee)	(cost excluding fee)	

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MONTHLY FINANCIAL REPORT

1. FH-2510
2. 7/27/69
3.
4. 97.2%
5.
6. $788,209
7. $826,250
8.
9.
10. $788,209
11. $826,250
12. -(38,041)
13. $23,754
14. $850,004
15. $839,735
16. (10,269)
17.

1. FH-2515
2. 7/27/69
3.
4. 98.4%
5.
6. $1,763,633
7. $1,764,884
8.
9.
10. $1,763,633
11. $1,764,884
12. (1,251)
13. $27,236
14. $1,792,120
15. $1,732,288
16. (59,832)
17.

STAT

CC:

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6/29/69

8900-97
8940-11
8940-13 (68%)
8940-14
8940-17
8940-24

CONTRACTOR MONTHLY FINANCIAL REPORT

"HARDWARE" TYPE CONTRACT

1. Contract Number FH 2515 Task Order No. (If Any) ________

2. Financial Status as of 6/29/69 (Date)

3. Contract Performance Period From ________ To ________

4.	Estimated Percentage of Work Completed	98.4%
5.	Estimated Contract Completion Date	
6.	Contractor Planned Cumulative Expenditures to Date	1,763,634
7.	Cumulative Actual Expenditures to Date	1,763,546
8.	Contractor Planned Outstanding Commitments	—
9.	Actual Outstanding Commitments	—
10.	Cumulative Planned Expenditures and Outstanding Commitments to Date (6 + 8)	1,763,634
11.	Cumulative Actual Expenditures and Outstanding Commitments to Date (7 + 9)	1,763,546
12.	Variance - Lines 10 - 11 (+ or -)	88
13.	Estimate to Complete Contract	28,577
14.	Total Estimated Amount Required to Perform Contract (7 + 13)	1,792,123
15.	Contract Funds Allocated	1,732,288
16.	Variance - Lines 15 - 14 (+ or -)	<59,835>
17.	Additional Amount for Work Proposed, But not yet Authorized	241,000

STAT

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AEROJET-GENERAL CORP. FINANCIAL REPORT

1.	AG-1100	1.	FH-2515	1.	FH-2510
2.	6/1/69	2.	6/1/69	2.	6/1/69
3.	6/5/68-6/1/69	3.	-	3.	-
4.	52%	4.	98.1%	4.	94.3%
5.	1/31/70	5.		5.	
6.	$2,028,387	6.	$1,763,601	6.	$766,257
7.	$1,807,426	7.	$1,760,998	7.	$291,995
8.	$321,613	8.	-	8.	-
9.	$203,532	9.	-	9.	-
10.	$2,350,000	10.	$1,763,601	10.	$766,257
11.	$2,010,958	11.	$1,760,998	11.	$791,995
12.	+$339,042	12.	+$2,603	12.	$-25,738
13.	$1,663,779	13.	$32,514	13.	$47,740
14.	$3,471,205	14.	$1,793,512	14.	$839,735
15.	$3,471,205	15.	$1,732,288	15.	$839,735
16.	-0-	16.	$-61,224	16.	-0-
17.	$7,728	17.	$241,000	17.	-0-

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CONTRACTOR MONTHLY FINANCIAL REPORT

"HARDWARE" TYPE CONTRACT

1. Contract Number FH-2515 Task Order No. (If Any) ____

2. Financial Status as of 4/27/69 (Date)

3. Contract Performance Period From ____ To ____

4.	Estimated Percentage of Work Completed	97.9%
5.	Estimated Contract Completion Date	-
6.	Contractor Planned Cumulative Expenditures to Date	1,758,075
7.	Cumulative Actual Expenditures to Date	1,756,462
8.	Contractor Planned Outstanding Commitments	-0-
9.	Actual Outstanding Commitments	-0-
10.	Cumulative Planned Expenditures and Outstanding Commitments to Date (6 + 8)	1,758,075
11.	Cumulative Actual Expenditures and Outstanding Commitments to Date (7 + 9)	1,756,462
12.	Variance - Lines 10 - 11 (+ or -)	1,613
13.	Estimate to Complete Contract	37,049
14.	Total Estimated Amount Required to Perform Contract (7 + 13)	1,793,511
15.	Contract Funds Allocated	1,732,288
16.	Variance - Lines 15 - 14 (+ or -)	-(61,223)
17.	Additional Amount for Work Proposed, But not yet Authorized	137,000

STAT

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ENCODER DEVELOPMENT

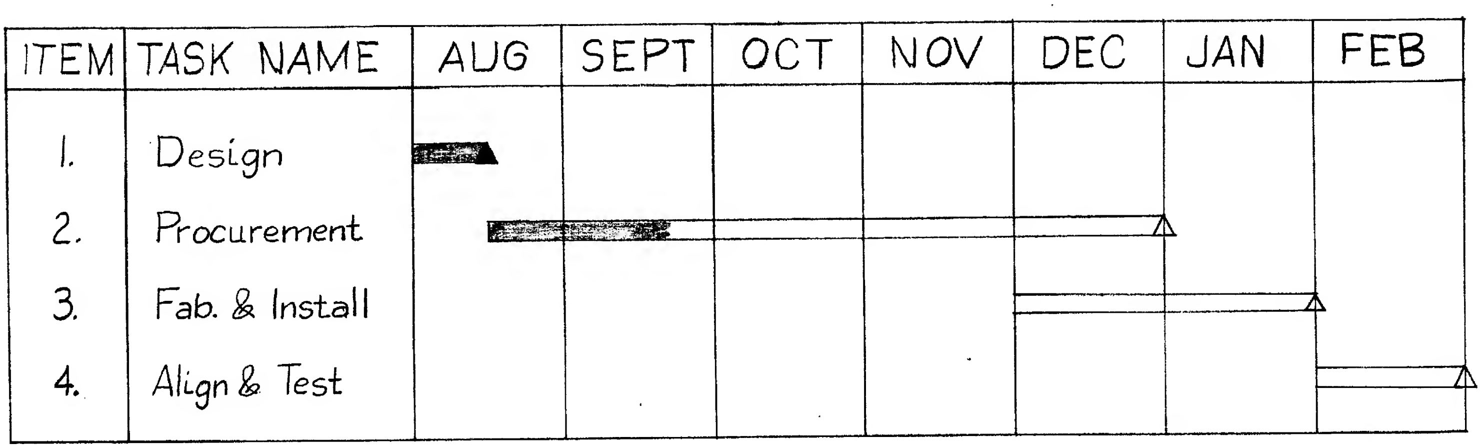

Figure 3.

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CONTRACTOR MONTHLY FINANCIAL REPORT

"HARDWARE" TYPE CONTRACT

1.	Contract Number FH-2515 Task Order No. (If Any) ____	
2.	Financial Status as of 12/1/68 (Date)	
3.	Contract Performance Period From ____ To ~~2/12/68~~	
4.	Estimated Percentage of Work Completed	97.4%
5.	Estimated Contract Completion Date	-0-
6.	Contractor Planned Cumulative Expenditures to Date	1,655,939.
7.	Cumulative Actual Expenditures to Date	1,671,298
8.	Contractor Planned Outstanding Commitments	-0-
9.	Actual Outstanding Commitments	7,994.
10.	Cumulative Planned Expenditures and Outstanding Commitments to Date (6 + 8)	1,655,939.
11.	Cumulative Actual Expenditures and Outstanding Commitments to Date (7 + 9)	1,679,292.
12.	Variance - Lines 10 - 11 (+ or -)	(23,353)
13.	Estimate to Complete Contract	43,254.
14.	Total Estimated Amount Required to Perform Contract (7 + 13)	1,714,552.
15.	Contract Funds Allocated	1,637,045.
16.	Variance - Lines 15 - 14 (+ or -)	Costs (77,507) not to
17.	Additional Amount for Work Proposed, But not yet Authorized	155,000. ask for this

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STAT

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ω 80
8900-97
8940-11
8940-13 (68%)
8940-14
8940-17

CONTRACTOR MONTHLY FINANCIAL REPORT

"HARDWARE" TYPE CONTRACT

1. Contract Number CH 2515 Task Order No. (If Any)
2. Financial Status as of 9/29/68 (Date)
3. Contract Performance Period From ______ To 9/29/68
4. Estimated Percentage of Work Completed 95.8
5. Estimated Contract Completion Date ______
6. Contractor Planned Cumulative Expenditures to Date 1,630,236
7. Cumulative Actual Expenditures to Date 1,646,079
8. Contractor Planned Outstanding Commitments -0-
9. Actual Outstanding Commitments 7,994
10. Cumulative Planned Expenditures and Outstanding Commitments to Date (6 + 8) 1,630,236
11. Cumulative Actual Expenditures and Outstanding Commitments to Date (7 + 9) 1,654,073
12. Variance - Lines 10 - 11 (+ or -) <23,837>
13. Estimate to Complete Contract 68,536
14. Total Estimated Amount Required to Perform Contract (7 + 13) 1,714,615
15. Contract Funds Allocated 1,637,045
16. Variance - Lines 15 - 14 (+ or -) <77,570>
17. Additional Amount for Work Proposed, But not yet Authorized 197,000

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Sanitized Copy Approved for Release 2010/05/19 : CIA-RDP72B00464R000100110001-2 W80

FINANCE WORK SHEET

DATE 9/1/68

1. FUNDING ALL W.O.'s
   - CPFF 1,506,045
   - FP 39,000
   - T&M 92,000
   - (A) TOTAL 1637,045

2. EXPENDED W.O. 8900-97
   - CPFF 894,960
   - FP —
   - T&M 89,042
   - TOTAL 984,002

3. BUDGET & EXPENDITURES CURRENT W.O.'s 8940-11, -13 & -17

MONTH END	a BASIC BUD.	b MICRO BUD.	c TOTAL BUD.	d BASIC EXPEND	e ⊛ MICRO EXP	f TOTAL EXP		NOT BUDGETED g T&M	NOT BUDGETED h OTHER
9/29/68	312,544	158,690		297,027	166,187		Encoder T&M		39,000
	8940-17 Added Scope 175,000			8940-17 added Scope 185,745			Expended 8940-14		13,118
	487,544	158,690	646,234	482,772	166,187	648,959			39,000

⊛ micro Expenditures prorated (W80 = 68%. 522 = 32%)

4. Planned Cum. Expenditures to date (2+3c) 1,630,236
5. Actual Cum Expenditures to date (2+3f) 1,646,079
   (8940-14 = 13,118)
6. Planned Outstanding commitments —
7. Actual Outstanding commitments 7,994
8. Estimate of % completed (C) 95.8
9. Estimated completion date ______
10. $ Est. to complete:

[illegible] - 2,758
[illegible] - 7,994
[illegible] - 0
[illegible] - 31,702
[illegible] - [illegible]

% remain $\left(\frac{S}{A}\right)$ = $\frac{68,536}{1,637,045}$ = 4.2

(C) % complete = 95.8

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7/29/68
S 22
8900-94
8940-10
8940-13 (32%)

CONTRACTOR MONTHLY FINANCIAL REPORT

"HARDWARE" TYPE CONTRACT

1. Contract Number FH 2510 Task Order No. (If Any) ______
2. Financial Status as of 9/29/68 (Date)
3. Contract Performance Period From ______ To 9/29/68
4. Estimated Percentage of Work Completed 92.9
5. Estimated Contract Completion Date ______
6. Contractor Planned Cumulative Expenditures to Date ______
7. Cumulative Actual Expenditures to Date 753,058
8. Contractor Planned Outstanding Commitments 731,522
9. Actual Outstanding Commitments -0-
10. Cumulative Planned Expenditures and Outstanding Commitments to Date (6 + 8) -0-
11. Cumulative Actual Expenditures and Outstanding Commitments to Date (7 + 9) 753,058
12. Variance - Lines 10 - 11 (+ or -) 731,522
13. Estimate to Complete Contract 21,536
14. Total Estimated Amount Required to Perform Contract (7 + 13) 58,853
15. Contract Funds Allocated 790,375
16. Variance - Lines 15 - 14 (+ or -) 839,735
17. Additional Amount for Work Proposed, But not yet Authorized 49,360 -0-

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S-22

FINANCE WORK SHEET — DATE 9/29/68

1. FUNDING ALL W.O.'s

CPFF	762,735
FP	-0-
T&M	77,000
(A) TOTAL	839,735

2. EXPENDED W.O. 8900-94

CPFF	595,431
FP	-0-
T&M	39,683
TOTAL	635,114

3. BUDGET & EXPENDITURES CURRENT W.O.'s 8940-10 + -13

a MONTH END	a BASIC BUD.	b MICRO BUD.	c TOTAL BUD.	d BASIC EXPEND	e ⓔ MICRO EXP	f TOTAL EXP		G NOT BUDGETED T&M	R OTHER
9/29/68	29,234	88,710	117,944	18,202	78,206	96,408	8900-94		
							-4000	11,923	
							-6000	24,393	
							(other)	1000	
							New		24,000
								37,316	24,000

ⓔ micro Expenditures prorated (W80 = 68% 522 = 32%)

4. Planned Cum. Expenditures to date (2+3c) 753,058
5. Actual Cum Expenditures to date (2+3f) 731,522

6. Planned Outstanding commitments -0-
7. Actual Outstanding committments -0-

8. Estimate of % completed ⓒ 92.9
9. Estimated Completion date ______
10. $ Est. to complete:

T/M - 37,317
Micro - 10,504
Basic - 11,0[illegible]

% remain $\left(\frac{B}{A}\right)$ = $\frac{58,833}{839,735}$ = 7.1

(c) % complete = 92.9

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File

W80
8900-97
8940-11
8940-13 (68%)
8940-14
8940-17

CONTRACTOR MONTHLY FINANCIAL REPORT

"HARDWARE" TYPE CONTRACT

1. Contract Number FH 2515 Task Order No. (If Any) ______
2. Financial Status as of 9/1/68 (Date)
3. Contract Performance Period From ______ To 9/1/68

4.	Estimated Percentage of Work Completed	94.6
5.	Estimated Contract Completion Date	
6.	Contractor Planned Cumulative Expenditures to Date	1,630,671
7.	Cumulative Actual Expenditures to Date	1,622,644
8.	Contractor Planned Outstanding Commitments	-0-
9.	Actual Outstanding Commitments	8,813
10.	Cumulative Planned Expenditures and Outstanding Commitments to Date (6 + 8)	1,630,671
11.	Cumulative Actual Expenditures and Outstanding Commitments to Date (7 + 9)	1,631,457
12.	Variance - Lines 10 - 11 (+ or -)	< 786 >
13.	Estimate to Complete Contract	89,741
14.	Total Estimated Amount Required to Perform Contract (7 + 13)	1,712,385
15.	Contract Funds Allocated	1,637,394
16.	Variance - Lines 15 - 14 (+ or -)	<74,991>
17.	Additional Amount for Work Proposed, But not yet Authorized	197,000

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CONTRACTOR MONTHLY FINANCIAL REPORT
"HARDWARE" TYPE CONTRACT

1.	Contract Number FH 2515 Task Order No. (If Any)	
2.	Financial Status as of 7/28/68 (Date)	
3.	Contract Performance Period from ______ to 7/28/68	
4.	Estimated Percentage of Work Completed	93.6%
5.	Estimated Contract Completion Date ______	
6.	Contractor Planned Cumulative Expenditures to Date	1,630,787
7.	Cumulative Actual Expenditures to Date	1,609,748
8.	Contractor Planned Outstanding Commitments	-0-
9.	Actual Outstanding Commitments	7,922
10.	Cumulative Planned Expenditures and Outstanding Commitments to Date (6 + 8)	1,630,787
11.	Cumulative Actual Expenditures and Outstanding Commitments to Date (7 + 9)	1,617,670
12.	Variance - Lines 10 - 11 (+ or -)	13,117
13.	Estimate to Complete Contract	105,012
14.	Total Estimated Amount Required to Perform Contract (7 + 13)	1,714,760
15.	Contract Funds Allocated	1,637,394
16.	Variance - Lines 15 - 14 (+ or -)	(77,366)
17.	Additional Amount for Work Proposed but not yet Authorized	143,000

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CONTRACTOR MONTHLY FINANCIAL REPORT
"HARDWARE" TYPE CONTRACT

1.	Contract Number FH 2515 Task Order No. (If Any)	
2.	Financial Status as of 6/30/68 (Date)	
3.	Contract Performance Period from ______ to 6/30/68	
4.	Estimated Percentage of Work Completed	92.4
5.	Estimated Contract Completion Date ______	
6.	Contractor Planned Cumulative Expenditures to Date	1,637,394
7.	Cumulative Actual Expenditures to Date	1,595,170
8.	Contractor Planned Outstanding Commitments	-0-
9.	Actual Outstanding Commitments	7,553
10.	Cumulative Planned Expenditures and Outstanding Commitments to Date (6 + 8)	1,637,394
11.	Cumulative Actual Expenditures and Outstanding Commitments to Date (7 + 9)	1,602,723
12.	Variance - Lines 10 - 11 (+ or -)	34,671
13.	Estimate to Complete Contract	123,872
14.	Total Estimated Amount Required to Perform Contract (7 + 13)	1,719,042
15.	Contract Funds Allocated	1,637,394
16.	Variance - Lines 15 - 14 (+ or -)	(81,648)
17.	Additional Amount for Work Proposed but not yet Authorized	197,000

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CONTRACTOR MONTHLY FINANCIAL REPORT
"HARDWARE" TYPE CONTRACT

1. Contract Number FH2515 Task Order No. (If Any) -

2. Financial Status as of 5/5/68 (Date)

3. Contract Performance Period from - to 5/5/68

4.	Estimated Percentage of Work Completed	95
5.	Estimated Contract Completion Date -	
6.	Contractor Planned Cumulative Expenditures to Date	1,534,332
7.	Cumulative Actual Expenditures to Date	1,570,611
8.	Contractor Planned Outstanding Commitments	-0-
9.	Actual Outstanding Commitments	7,923
10.	Cumulative Planned Expenditures and Outstanding Commitments to Date (6 + 8)	1,534,332
11.	Cumulative Actual Expenditures and Outstanding Commitments to Date (7 + 9)	1,578,534
12.	Variance - Lines 10 - 11 (+ or -)	(44,202)
13.	Estimate to Complete Contract	66,347
14.	Total Estimated Amount Required to Perform Contract (7 + 13)	1,644,881
15.	Contract Funds Allocated	1,562,394
16.	Variance - Lines 15 - 14 (+ or -)	(82,487)
17.	Additional Amount for Work Proposed but not yet Authorized	197,858

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CONTRACTOR MONTHLY FINANCIAL REPORT
"HARDWARE" TYPE CONTRACT

1.	Contract Number **FH 2515** Task Order No. (If Any)	
2.	Financial Status as of **3/31/68** (Date)	
3.	Contract Performance Period from ______ to **3/31/68**	
4.	Estimated Percentage of Work Completed	**97%**
5.	Estimated Contract Completion Date **7/1/68**	
6.	Contractor Planned Cumulative Expenditures to Date	**1,524,064**
7.	Cumulative Actual Expenditures to Date	**1,558,517**
8.	Contractor Planned Outstanding Commitments	**-0-**
9.	Actual Outstanding Commitments	**7,993**
10.	Cumulative Planned Expenditures and Outstanding Commitments to Date (6 + 8)	**1,524,064**
11.	Cumulative Actual Expenditures and Outstanding Commitments to Date (7 + 9)	**1,566,510**
12.	Variance - Lines 10 - 11 (+ or -)	**(42,446)**
13.	Estimate to Complete Contract	**51,265**
14.	Total Estimated Amount Required to Perform Contract (7 + 13)	**1,609,782**
15.	Contract Funds Allocated	**1,527,394**
16.	Variance - Lines 15 - 14 (+ or -)	**(82,388)**
17.	Additional Amount for Work Proposed but not yet Authorized	**197,858**
	(T&M Repair & Test, etc.)	**10,000**

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CONTRACTOR MONTHLY FINANCIAL REPORT
"HARDWARE" TYPE CONTRACT

1.	Contract Number FH 2515 Task Order No. (If Any)	-0-
2.	Financial Status as of 3/3/68 (Date)	
3.	Contract Performance Period from 12/31/67 to 3/3/68	
4.	Estimated Percentage of Work Completed	97%
5.	Estimated Contract Completion Date 7/1/68	
6.	Contractor Planned Cumulative Expenditures to Date	1,517,867
7.	Cumulative Actual Expenditures to Date	1,551,833
8.	Contractor Planned Outstanding Commitments	-0-
9.	Actual Outstanding Commitments	7,993
10.	Cumulative Planned Expenditures and Outstanding Commitments to Date (6 + 8)	1,517,867
11.	Cumulative Actual Expenditures and Outstanding Commitments to Date (7 + 9)	1,559,826
12.	Variance - Lines 10 - 11 (+ or -)	(41,959)
13.	Estimate to Complete Contract	55,842
14.	Total Estimated Amount Required to Perform Contract (7 + 13)	1,607,675
15.	Contract Funds Allocated	1,527,394
16.	Variance - Lines 15 - 14 (+ or -)	(80,281)
17.	Additional Amount for Work Proposed but not yet Authorized	197,858

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CONTRACTOR MONTHLY FINANCIAL REPORT
"HARDWARE" TYPE CONTRACT

1.	Contract Number FH 2515 Task Order No. (If Any)	
2.	Financial Status as of 12/31/67 (Date)	
3.	Contract Performance Period from ______ to 12/31/67	
4.	Estimated Percentage of Work Completed	97%
5.	Estimated Contract Completion Date 7/1/68	
6.	Contractor Planned Cumulative Expenditures to Date	$ 1,498,473
7.	Cumulative Actual Expenditures to Date	1,525,135
8.	Contractor Planned Outstanding Commitments	-0-
9.	Actual Outstanding Commitments	7,993
10.	Cumulative Planned Expenditures and Outstanding Commitments to Date (6 + 8)	1,498,473
11.	Cumulative Actual Expenditures and Outstanding Commitments to Date (7 + 9)	1,533,128
12.	Variance - Lines 10 - 11 (+ or -)	(34,655)
13.	Estimate to Complete Contract	42,293
14.	Total Estimated Amount Required to Perform Contract (7 + 13)	1,567,428
15.	Contract Funds Allocated	1,497,394
16.	Variance - Lines 15 - 14 (+ or -)	(70,034)
17.	Additional Amount for Work Proposed but not yet Authorized	197,858
	(T&M Repair & Test Etc.)	30,000

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W80

CONTRACTOR MONTHLY FINANCIAL REPORT

"HARDWARE" TYPE CONTRACT

1. Contract Number FH 2515 Task Order No. (If Any) ____

2. Financial Status as of 1 October 1967 (Date)

3. Contract Performance Period From 10-28-65 To 10-15-67

4.	Estimated Percentage of Work Completed	93%
5.	Estimated Contract Completion Date	12-30-67
6.	Contractor Planned Cumulative Expenditures to Date	1,479,252
7.	Cumulative Actual Expenditures to Date	1,465,486
8.	Contractor Planned Outstanding Commitments	-0-
9.	Actual Outstanding Commitments	9,227
10.	Cumulative Planned Expenditures and Outstanding Commitments to Date (6 + 8)	1,479,252
11.	Cumulative Actual Expenditures and Outstanding Commitments to Date (7 + 9)	1,474,713
12.	Variance - Lines 10 - 11 (+ or -)	+4,539
13.	Estimate to Complete Contract	103,295
14.	Total Estimated Amount Required to Perform Contract (7 + 13)	1,568,781
15.	Contract Funds Allocated	1,497,394
16.	Variance - Lines 15 - 14 (+ or -)	(71,387)
17.	Additional Amount for Work Proposed, But not yet Authorized	197,858

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10/29/67

S22 · FH2512 W.O.		CONTRACT COU LTRAL	ACTUAL EXPEND.	O/R U/R
8900-94	ORIGINAL CONCEPT	581,319	634,498	<53,179>
8940-10	RETROFIT	138,000	92,383	45,617
8940-13	MICRO AVIA 32% S22 -10 68% W80 -11	247,400	245,957	

W80- FH 2515				
8900-97	ORIGINAL	809,047	911,754	<102,707>
8940-11	RETROFIT	372,974	427,606	<54,632>
-14	~~AB FUNDS~~ RATE DISCRIMINATION ADDED SCOPE	39,000	1,728	37,272
-17	DISCRETE ELECTRONICS	175,349	167,902	7,447
			TOTAL O/R	<120,182>
			PROJECTED O/R	<157,454>

T/M RELEASES				
				(30,000)
8900-94 -	INTEGRATION 4000	48,000	39,083	8,917
	FIELD SERV. - 6000	25,000	671	24,329
8900-97	FIELD SERV. - 3500	27,000	17,984	9,016

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[redacted] has been in the hospital and will probably be there for a few more weeks. I am having to pick up out of both boxes.

Al is up north and has not been available to prepare the technical report.

Al talked to [redacted] about it and I gather there is a mutual understanding that the next report will cover two months.

For this reason, I'll send on the financial I've been holding.

[redacted]

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DATE 17 January 1968

MEMORANDUM FOR: Chief, Industrial Audit Division, OSA

SUBJECT: Request for Audit

Contractor: Aerojet General

Contract No: FH-2515

Type of Contract: CPFF

Type of Audit Required: Increase in scope

Dollar Value of Contract: Spares 73,186
Integrete Modules 4,575
77,761

Date Audit Required: ASAP

NEGOTIATOR: [redacted] CMD/OSA 25X1

- -

DATE 1/18/68

MEMORANDUM FOR: Contracts Management Division, OSA

Audit Scheduled For: ASAP

[redacted] 25X1

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Sanitized Copy Approved for Release 2010/05/19 : CIA-RDP72B00464R000100110001-2

DATE 17 January 1968

MEMORANDUM FOR: Chief, Industrial Audit Division, OSA

SUBJECT: Request for Audit

Contractor: Aerojet General

Contract No: FH-2515

Type of Contract: CPFF

Type of Audit Required: Increase in scope

Dollar Value of Contract: Spares 73,186
Integrate 4,575
Modules
77,761

Date Audit Required: ASAP

NEGOTIATOR: [redacted] 25X1
CMD/OSA

- -

DATE ____________________

MEMORANDUM FOR: Contracts Management Division, OSA

Audit Scheduled For: ____________________

____
C/IAD/OSA

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Doc. # 177-I
Copy 1 of 4

CJC:68002
3 January 1968

STAT [redacted]

OSA - 0166-68

On 14 November 1967 we were in receipt of a letter (Idea-0688/67) from [redacted] commending Al and John specifically for the effort they have put forth on the W-80 job. For this show of appreciation, we are indeed grateful.

STAT

There are other areas of the letter which Al is just now able to look at, so I don't have any answers for [redacted] at this time. However, the specific reason for this letter is to forward the cost to [redacted] for the incorporation and environmental test of 100 microelectronic modules in system number 2 as requested in the fourth paragraph of [redacted] letter.

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Environmental tests for the first W80C system are based on discrete component modules. The costs presented as Enclosure (1) are considered as added scope items resulting from the test of two W80C configurations.

Also [redacted] you called [redacted] and advised him that you needed the spare parts list and costs for one set of W80C spares. Enclosure (2) is a copy of a spare parts list we prepared last July. I have brought it up to date with new rates and burdens.

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If there is anything further we can do, please feel free to call on us.

Yours very truly,

STAT [redacted]

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Enclosure (1)

Integrate 100 microelectronic modules into system number 2

60 salary hours @ 6.14	368	
80 hourly hours @ 3.72	298	
	666	
Direct Labor Overhead @ 130%	866	
		1532

Temp-Alt Test System 2

40 salary hours @ 6.14	246	
60 hourly hours @ 3.72	223	
	469	
Direct Labor Overhead @ 130%	610	
		1079

Vibration Test System 2

40 salary hours @ 6.14	246	
80 hourly hours @ 3.72	298	
	544	
Direct Labor Overhead @ 130%	707	
		1251

Acceptance Test System 2

No charge - Considered part of the original contract

	3862
G&A @ 9.7%	375
	4237
Fee @ 8%	338
Est. Cost Plus Fee	4575

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ONE SET W80C SPARES 1/3/68

QTY. DESCRIPTION	DEL WKS	SAL HRS @ 6.14	HRLY HRS @ 3.72	UNBURDENED LABOR $	DLO @ 130%	MATERIAL PURCH PTS	MAT. BRDN @ 10%	PER UNIT EST COST	TOTAL EST COST
1 DETECTOR ARRAY	16	168 –	100 –	1404 –	1825 –	34000 –	3400 –	40629 –	40629 –
1 SET POWER SUPPLIES	12					3600 –	360 –	3960 –	3960 –
1 QUARTZ DOME BLANK	4					1300 –	130 –	1430	1430 –
DOME FAB AND ASSY	4	36 –	240 –	1114 –	1448 –	450 –	45 –	3057 –	3057 –
2 T.E. COOLERS	12					200 –	20 –	220 –	440 –
1 EL TORQUER T-2170	4					204 –	20 –	224 –	224 –
1 AZ TORQUER T-4411A	4					372 –	37 –	409 –	409 –
2 TACH GENERATORS	4					220 –	22 –	242 –	484 –
2 AZ SERVO POTS	–					50 –	5 –	55 –	110 –
– MISC. ELECT. PARTS	6					2000 –	200 –	2200 –	2200 –
10 ANALOG MODULES	–	10 –	20 –	135 –	176 –	234 –	23 –	568 –	5680 –
– DISCRETE MOD PARTS	6					1780 –	178 –	1958 –	1958 –
2 OPTICAL FILTERS	12	20 –	30 –	235 –	306 –	50 –	5 –	596 –	1192 –
									61773 –
							G AND A @ 9.7%		5992 –
									67765 –
							FEE @ 8%		5421 –

73186 –

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Frank

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FH-2515

W80 INFRARED SYSTEM

PROGRESS REPORT No. 22

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I INTRODUCTION

The objective of the present program is to modify two W80C Infrared Systems for flight evaluation. The principal modifications include new decision logic circuits, detector arrays, analog circuits and power supplies. Only the scanner and optics remain unchanged. Monthly progress for the period of 15 August to 15 September is presented in this report. Work during this period has primarily been concerned with the production of 220 analog modules and system alignment in preparation for acceptance testing and delivery.

On 24 July, an emphasis was placed on delivery of both W80C systems as soon as possible. Objective dates established at this time were 15 September for System No. 1 and 2 October for System No. 2. At the same time, a backup program was undertaken for 220 analog modules using discrete components, primarily because of vendor mask problems for the microelectronic modules. Presently, 106 discrete analog modules have been completed for one system with the remaining units scheduled for completion in early October; if transistor deliveries can be made. Estimated system delivery dates now are the weeks of 25 September for System No. 1 and 9 October for System No. 2.

The Activity Flow Chart of Figure 1 presents the present program status. At the top of this chart is noted the new discrete module effort and the estimated slippage in the microelectronic modules. As shown, one system of analog amplifiers is now available and the alignment of System No. 1 complete. Pod installation and threshold adjustment remain before system testing. Completion of the noted test plans have slipped due to the extended effort on the analog modules. Figure 2, the Milestone Chart, has been updated and is self-explanatory. Figure 3 depicts the microelectronic schedule and notes the

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slippage in this area. It may be noted that this effort, beyond the first 110 units, is proceeding on an minimum cost basis due to the previously-mentioned mask problems and funding limitations.

II PROGRAM STATUS

A. Subsystem Status

1. Analog Microelectronics - Because of mask and funding problems, deliveries have slipped as shown in Figure 3. Delivery estimates now are for 110 units on 25 September, 110 units on 1 November and the remaining 100 units approximately the last of November. New masks have been received and depositions show them to be acceptable.

2. Analog Discrete Electronics - Since the 26th of July, when this program was initiated as a backup for system delivery in September, progress has been outstanding. Although the initial schedule of 110 units by 3 September (5 weeks) was next to an impossible one, it was almost achieved. In the seven weeks which have passed, design evaluations were completed, a package design was completed and an attempt was made to procure all parts within a two-week period. Presently, 106 modules have been manufactured, aligned, and burned in for a period of 48 hours. The remaining units are scheduled for the week of 9 October, providing the final delivery of two types of transistors can be achieved. The vendors involved are Texas Instruments, Amelco and Siliconix.

3. Digital and Servo Logic - Assembly and testing of all logic and servo cards are now complete. The eleven card assembly for System No. 1 has been aligned and undergone temperature tests. It is ready for pod installation.

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4. Power Supplies - The two power supply packages for each system have been in operation with system elements for over three weeks. In addition, they have undergone temperature chamber tests. To date, a number of design weaknesses have been located and rectified by the vendor. These weaknesses were primarily in the short circuit proof circuits. Evaluations will continue in order to assure no other weaknesses exist.

5. Servo-Scanner Alignment - Servo scanner alignment has been completed for system No. 1 and is in process for system No. 2. In addition, temperature chamber tests have been completed and were satisfactory.

6. Telescope - Detector Assembly - Two telescope-detector assemblies have been completed, aligned and evaluated under cold-focus conditions. Optical and detector parameters have been evaluated from 80°F to -55°F and focus set for a telescope temperature of -10°F. As a result of these tests, two operational conditions have been changed. First, thermal blankets will not be used on the telescope due to the compensating effects detector improvement at cold temperatures and the smaller change in focus shift at temperatures below 0°F. Secondly, tests conducted on the thermoelectric cooler, with the maximum available heat sink, vs. heat sinking the detectors directly to the pod skin, have shown the latter approach to be better for the present telescope-detector design. A detector to skin Δt of 11 to 13°F will be provided in either case. The previous Δt (ref. thermal flight test data) was approximately 30°F.

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B. System Status

System No. 1 is now ready for pod installation. Subsystem elements will be assembled in the pod during the next week for final checking before system tests. System No. 2 is in the process of alignment except for analog amplifiers.

C. Interface Status

Emitter-follower stages have been added in all high impedance data lines to minimize interfacing problems. With the addition of these isolation stages and the information conveyed in the W80C interface document, no interface problems are apparent at this time.

D. Procurement

The following procurement items are active at this time and are problem areas for System No. 2.

1. Transistors - Texas Instruments, Amelco and Siliconix procurements are delinquent at this time. Amelco has repeatedly slipped with Siliconix (their backup source) coming through. Procurement is now being terminated with Amelco since Siliconix has shown they can complete our requirements. Texas Instruments delivery is the most critical, they are over three weeks late and have provided no parts. The possible completion of approximately 150 analog modules has only been feasible by buying from another program's stock which must be replaced. A partial delivery must be obtained in order to complete modules for System 2.

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2. Analog Module P. C. Boards - Four vendors were finally necessary to assure at least two qualified sources. Procurement has been cancelled with the two initial vendors and an adequate backlog is now available and assure no production problems. Circuit Research provided the best units with Circuitronix considerably poorer in quality.

E. Fabrication Status

All fabrication is complete except for clean-up as required during pod installation.

F. Assembly Status

All assembly is complete except for the second 100 analog modules.

G. Analytic or Test Data

No analytic or test data is finalized to the point where it may be released at this time.

H. Technical Conferences

STAT

1. [redacted] visited John and Al, 11 September 1967, Subject: W80 Program Review and delivery status.

III PROBLEM AREAS

1. Analog Transistors - Delivery of Texas Instrument transistors within one week is necessary in order to prevent further slippages.

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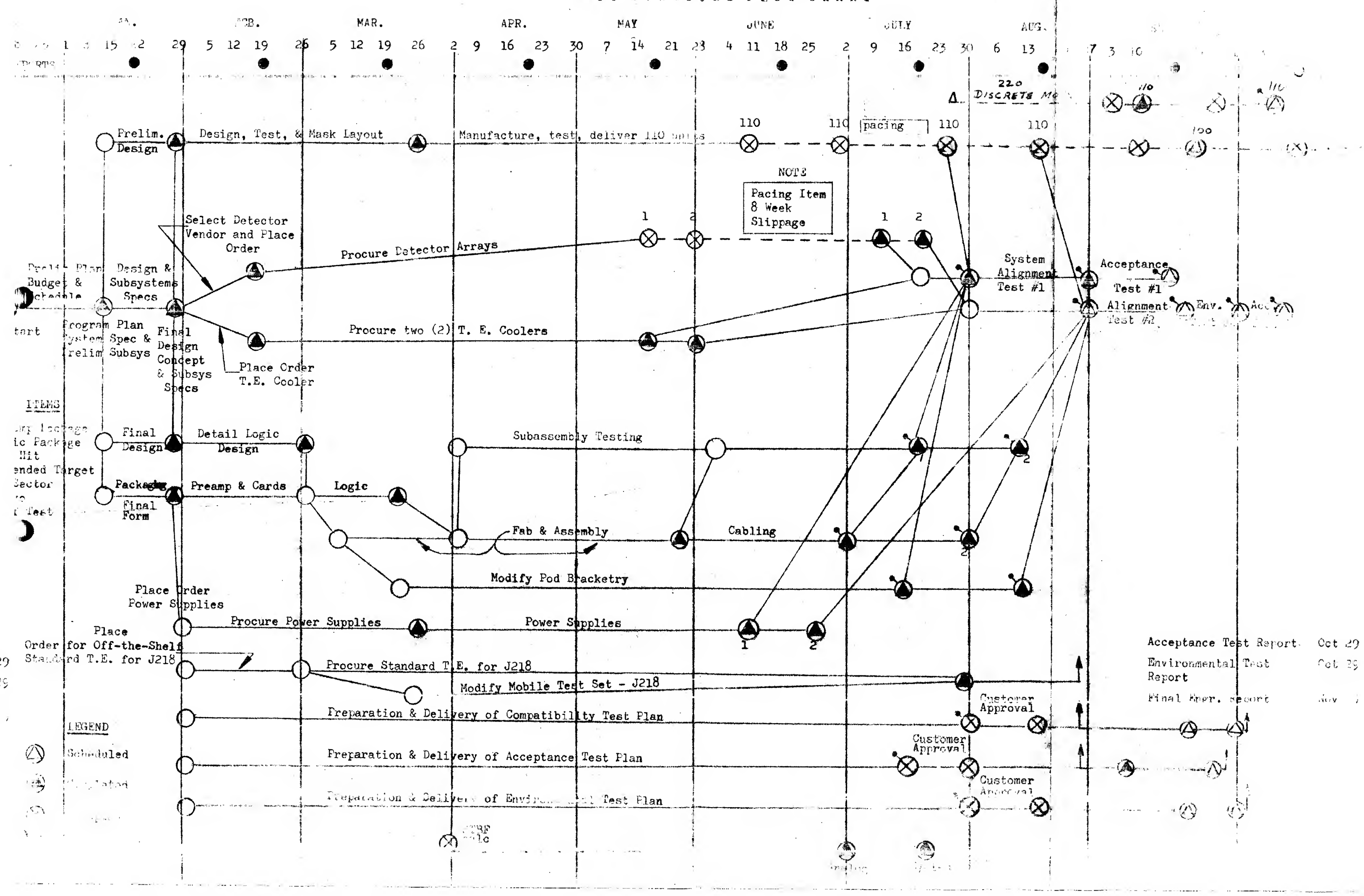
W 8 0 SCHEDULE FLOW CHART



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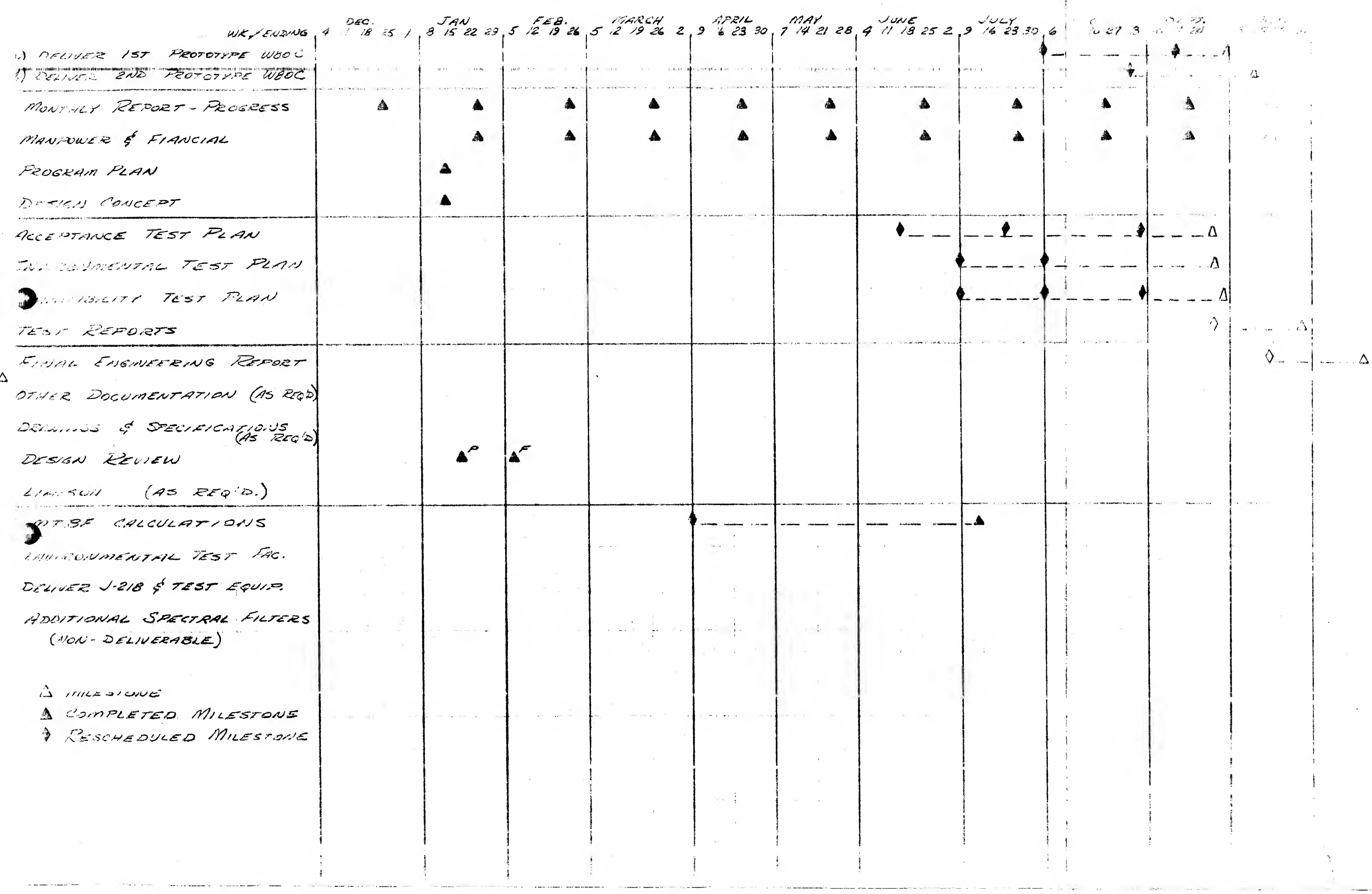
W80 MILESTONE CHART



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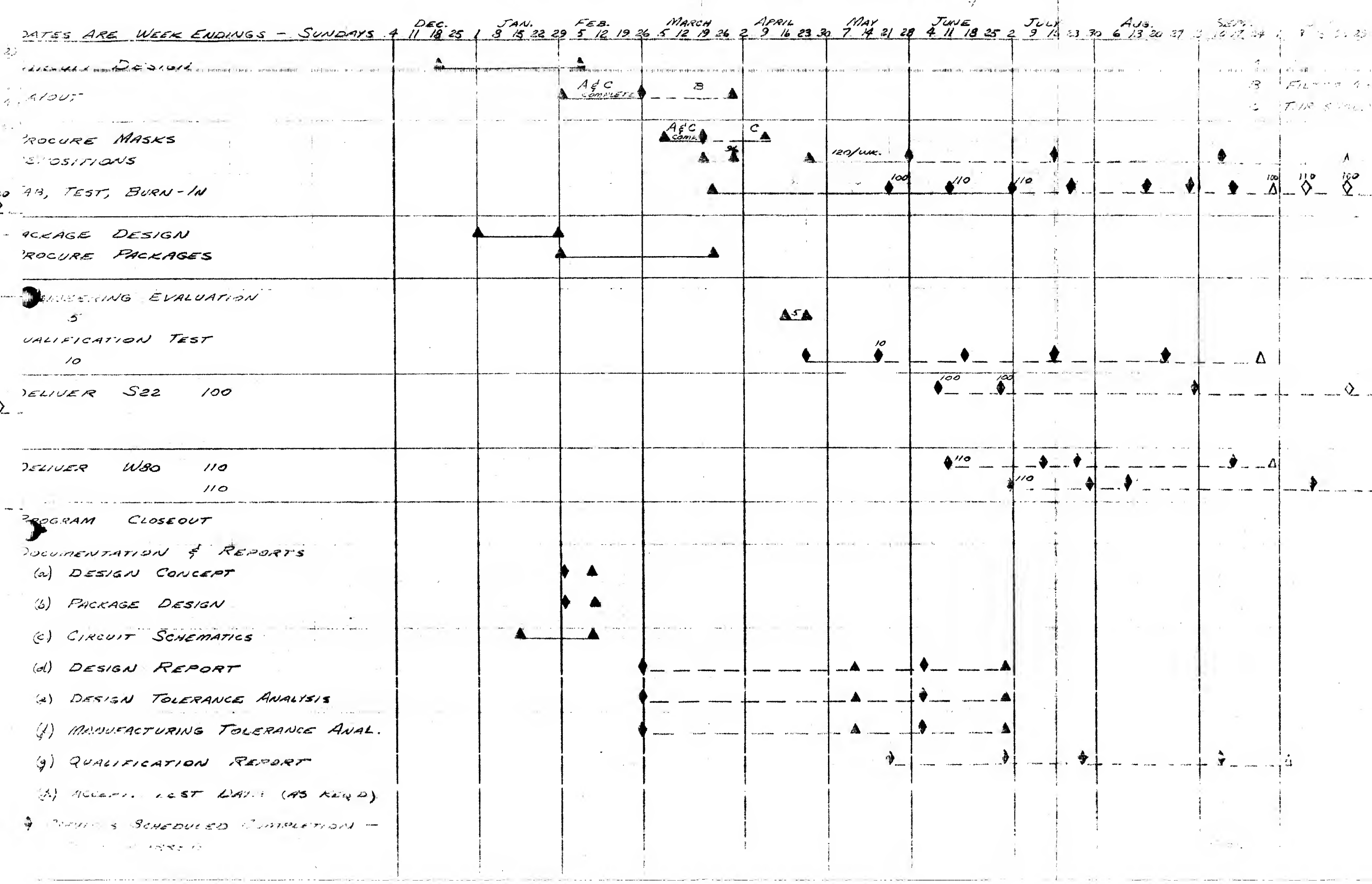
S22 & W80 MICROELECTRONICS SCHEDULE



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CONTRACTOR MONTHLY FINANCIAL REPORT

"HARDWARE" TYPE CONTRACT

1.	Contract Number FH 2515 Task Order No. (If Any) ______	
2.	Financial Status as of 9/3/67 (Date)	
3.	Contract Performance Period From ______ To 10/15/67	
4.	Estimated Percentage of Work Completed	89%
5.	Estimated Contract Completion Date Basic 12/15/67 Encoder 12/30/67)	12/30/67
6.	Contractor Planned Cumulative Expenditures to Date	1,448,552
7.	Cumulative Actual Expenditures to Date	1,386,419
8.	Contractor Planned Outstanding Commitments	-0-
9.	Actual Outstanding Commitments	65,648
10.	Cumulative Planned Expenditures and Outstanding Commitments to Date (6 + 8)	1,448,552
11.	Cumulative Actual Expenditures and Outstanding Commitments to Date (7 + 9)	1,452,067
12.	Variance - Lines 10 - 11 (+ or -)	- 3515
13.	Estimate to Complete Contract	102,000
14.	Total Estimated Amount Required to Perform Contract (7 + 13)	1,554,067
15.	Contract Funds Allocated	1,497,394
16.	Variance - Lines 15 - 14 (+ or -)	- 56,673
17.	Additional Amount for Work Proposed, But not yet Authorized	197,858

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CONTRACTOR MONTHLY FINANCIAL REPORT

"HARDWARE" TYPE CONTRACT

1. Contract Number FH2515 Task Order No. (If Any) ________
2. Financial Status as of 7/30/67 (Date)
3. Contract Performance Period From ? To 10/15/67
4. Estimated Percentage of Work Completed 93.1%
5. Estimated Contract Completion Date Basic 12/15/67 Rework 12/30/67 — 12/30/67
6. Contractor Planned Cumulative Expenditures to Date 4293,142
7. Cumulative Actual Expenditures to Date 4,278,890
8. Contractor Planned Outstanding Commitments — 0 —
9. Actual Outstanding Commitments 17,531
10. Cumulative Planned Expenditures and Outstanding Commitments to Date (6 + 8) 4,293,142
11. Cumulative Actual Expenditures and Outstanding Commitments to Date (7 + 9) 4,296,421
12. Variance - Lines 10 - 11 (+ or -) — 3,279
13. Estimate to Complete Contract 83,000
14. Total Estimated Amount Required to Perform Contract (7 + 13) 4,378,890
15. Contract Funds Allocated (Includes Fee) 4,312,045
16. Variance - Lines 15 - 14 (+ or -) — 66,845
17. Additional Amount for Work Proposed, But not yet Authorized 119,000

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OSA - 2866-67

W-80 INFRARED SCANNER

PROGRESS REPORT No. 20

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I INTRODUCTION

The objective of the present program is to modify two Model W80C Infrared Scanners so as to provide an improvement in performance. This modification primarily consists of new decision logic circuits, detectors and analog circuits. The monthly progress from 15 June to 15 July 1967 is presented in this report.

The main effort during the past month has been concerned with the production 220 analog electronic modules, the testing of assembled logic and servo cards, the wiring of system cables and the delivery of new detector arrays. Also, during this report period, a decision was made to proceed with the elevation encoder retrofit. The delivery slippage and cost overrun of the detector vendor, as previously reported, has been a major problem area. Since delivery of the first array has now taken place, the critical remaining items are the multi-layer P. C. boards and the analog circuits. The multi-layer boards, due in early June, are causing delays in tests which have an ultimate effect on system assembly and alignment.

The Activity Flow Chart of Figure 1 presents the present program status. Items shown completed during this reporting period are: delivery of one detector array, delivery of two sets of power supplies, a re-evaluation of the system MTBF analysis and completion of one logic-servo package. Figure 2, the Milestone Chart, has been updated and is self-explanatory. The analog microelectronic schedule of Figure 3 has been updated to show completion of certain documents and reports.

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II PROGRAM STATUS

A. Subsystem Status

1. Analog Microelectronics - The present status of this effort is shown in Table I. A group of 21 modules are now in test and evaluation. Data from these tests will be evaluated prior to initiating tests on subsequent units. One module has been subjected to vibration with a second one soon to follow. This unit was vibrated at 10g on two axis (20 to 20,000 cps). Operation was checked before and after vibration and no detrimental effects were noted.

As noted in the past report, problems exist in the deposition yield due to masks which are not as good as specified. In addition, low noise input transistors for the preamps must be selected and in most cases they do not meet vendors stated noise figure. Since the minimum equivalent detector noise input is approximately 9 micro volts, it is desired to keep the equivalent amplifier noise at 4 micro volts or less. These low noise transistors have been exhibiting noise values of from 3 to 6 micro volts.

2. Digital & Servo Logic - Table II presents the current assembly and testing status of the logic and servo cards and system wiring. There are no anticipated problems in this phase.

3. Elevation Encoder Retrofit - Work was initiated on this phase during the past month. At present, all design work is waiting for final vendor encoder design data. Once this is received and frozen the W-80 gimbal designs may be completed.

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B. System Status

No work is in process at the system level.

C. Interface Status

Word was received that vehicle personnel have determined a satisfactory mounting for thermal tests. A visit is planned for 19 July 1967 to review interface problems associated with these tests.

A preliminary W-80C interface document has been prepared. One section, the radiometric output, remains open and is subject to change.

D. Procurement

1. Detectors - A substantial schedule slippage and cost overrun has been experienced in this area. The first of two detector arrays was received on 10 July 1965, eight and a half weeks late. The second unit is now scheduled for testing on 14 July.

The first array received has 5 bad channels out of 100. The remaining channels look quite good with most D stars ranging from 1.2 to 1.7×10^{10}; 1.4×10^{10} was specified.

2. Thermoelectric Cooler - This item is complete as previously reported.

3. Power Supplies - All four units, two for each system, were delivered in late June. These units will now be tested with various portions of the system. Total weight of the new power supplies is 7.5 pounds per system; this compares with the previous power supply weight of 10 pounds per system.

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E. Fabrication Status

The thermoelectric cooler heat strap modification remains to be made.

F. Assembly Status

Both system cable assemblies are approximately 90% complete. No tests have been made on these units to date.

G. Analytic and Test Data

MTBF calculations for the new W80C design have been completed. The MTBF for the W80 system was computed to be 1259 hours. With this MTBF, an availability of 0.997 can be met with a mean time to repair of 3.788 hours or less.

H. Technical Conferences

STAT [redacted] visited John and Al, 28 June 1967, subject: Program Review.

III PROBLEM AREAS

1. Printed Circuit Boards - A multi-layer P. C. board used for the analog modules has now become critical. This item, due on 10 June, still has not been received. Vendor problems occurred because key personnel were lost during a company acquisition process. Backup sources are being investigated in case the vendor cannot resolve his problem.

2. Potential problems still remain in the analog circuit area. The potential problems are schedule and performance. This is caused mainly from poor masks which give a low deposition yield and input transistors which have a higher noise than specified.

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TABLE I

ANALOG MICROELECTRONIC STATUS

	PreAmp-Filter	AGC	Threshold
Circuit Design	(C) Complete	(C) Complete	(C) Complete
Package Design	(C)	(C)	(C)
Worse Case Analysis	(C)	(C)	(C)
Mask Fabrication	(C)	(C)	(C)
Deposition & Test	55%	48%	80%
Component Delivery	100%	100%	100%
Assembly	55%	42%	51%
Module Status	53 Units		

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TABLE II

		SYSTEM I		SYSTEM II	
		Assembled	Tested	Assembled	Tested
A.	Digital & Servo Assembly				
	1. Az Servo (1 Bd)	X	X	X	X
	2. El Servo (1 Bd)	X	X	X	X
	3. Scan Pattern (3 Bd)	X	X	Short 1 Bd (due 8/7)	66%
	4. Sig. Proc. & Del. (1 Bd)	X	X	X	X
	5. Target Size Disc (2 Bd)	X	X	X	X
	6. Targ. Stor. & Val. (2 Bd)	X	X	X	X
	7. Sector Time & Gates (1 Bd)	X	X	X	X
B.	Power Supplies	X	None	X	None
C.	System Cabling	90%	None	80%	None
D.	Scanner Mod.	X	X	X	X
E.	Detectors	X	X	Due 7/15	--
F.	T E Cooler	X	X	X	X

(X) completed

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W80 SCHEDULE FLOW CHART

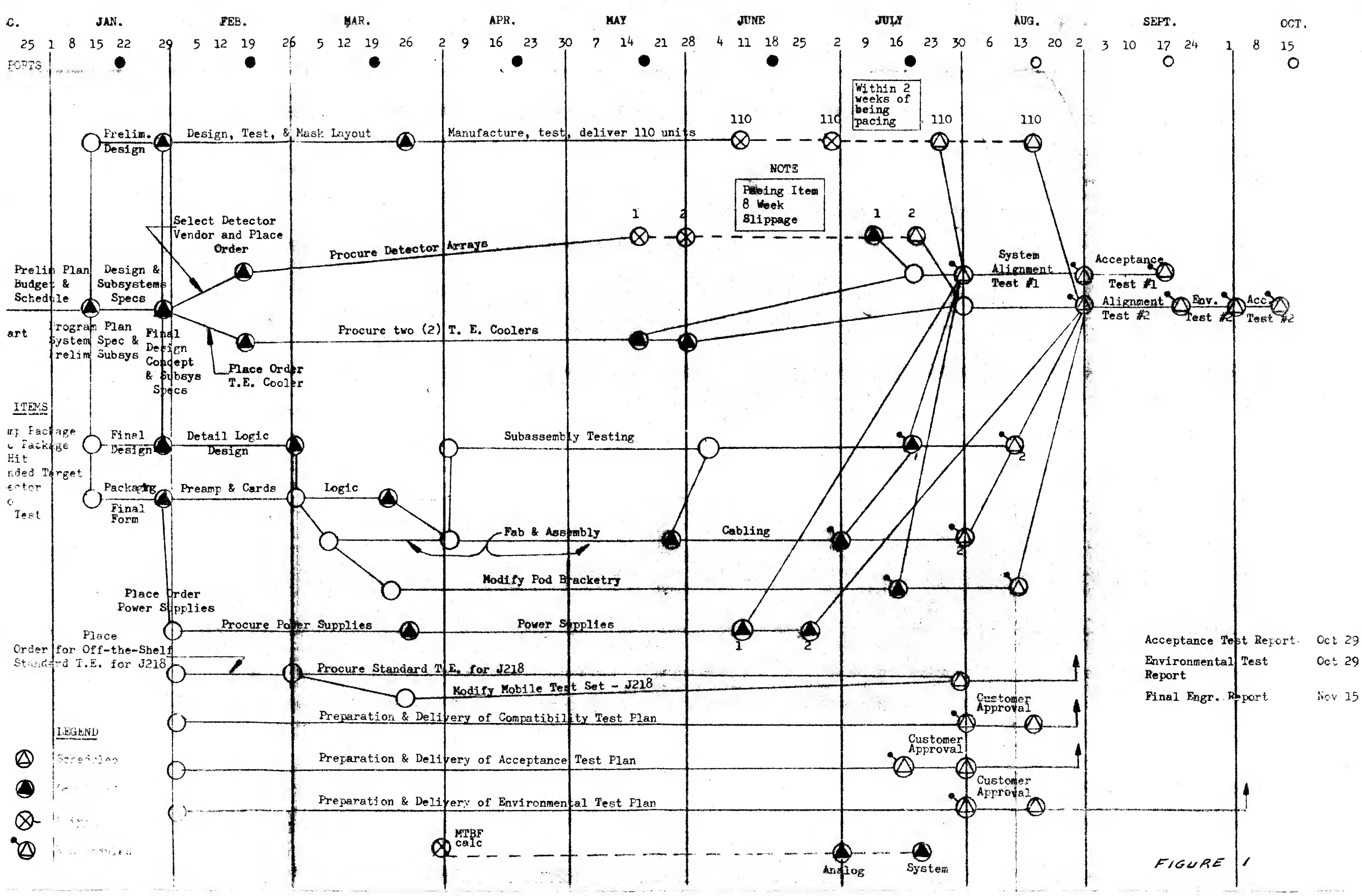

FIGURE 1

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W80 MILESTONE CHART

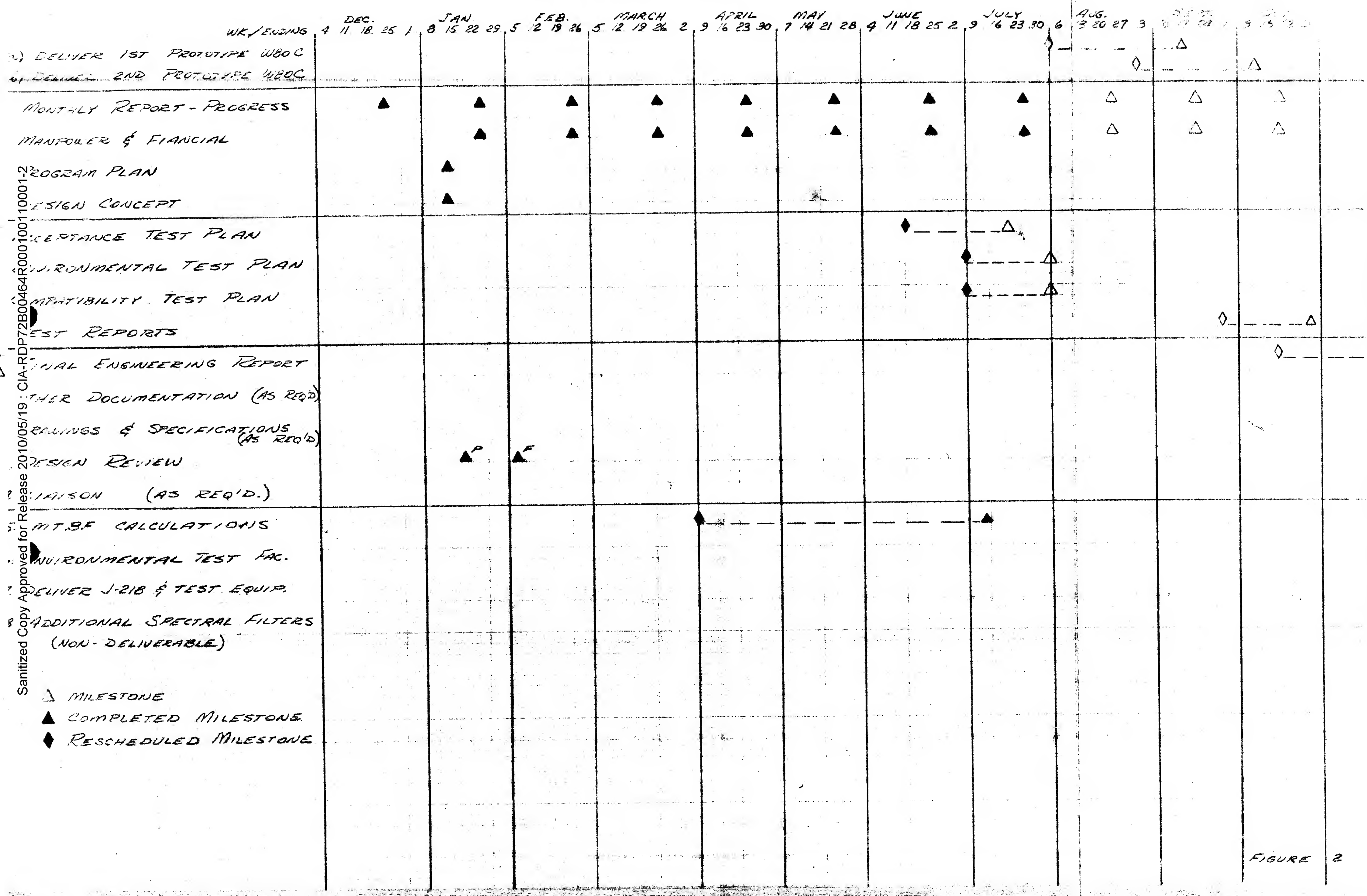

FIGURE 2

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S22 & W80 MICROELECTRONICS SCHEDULE

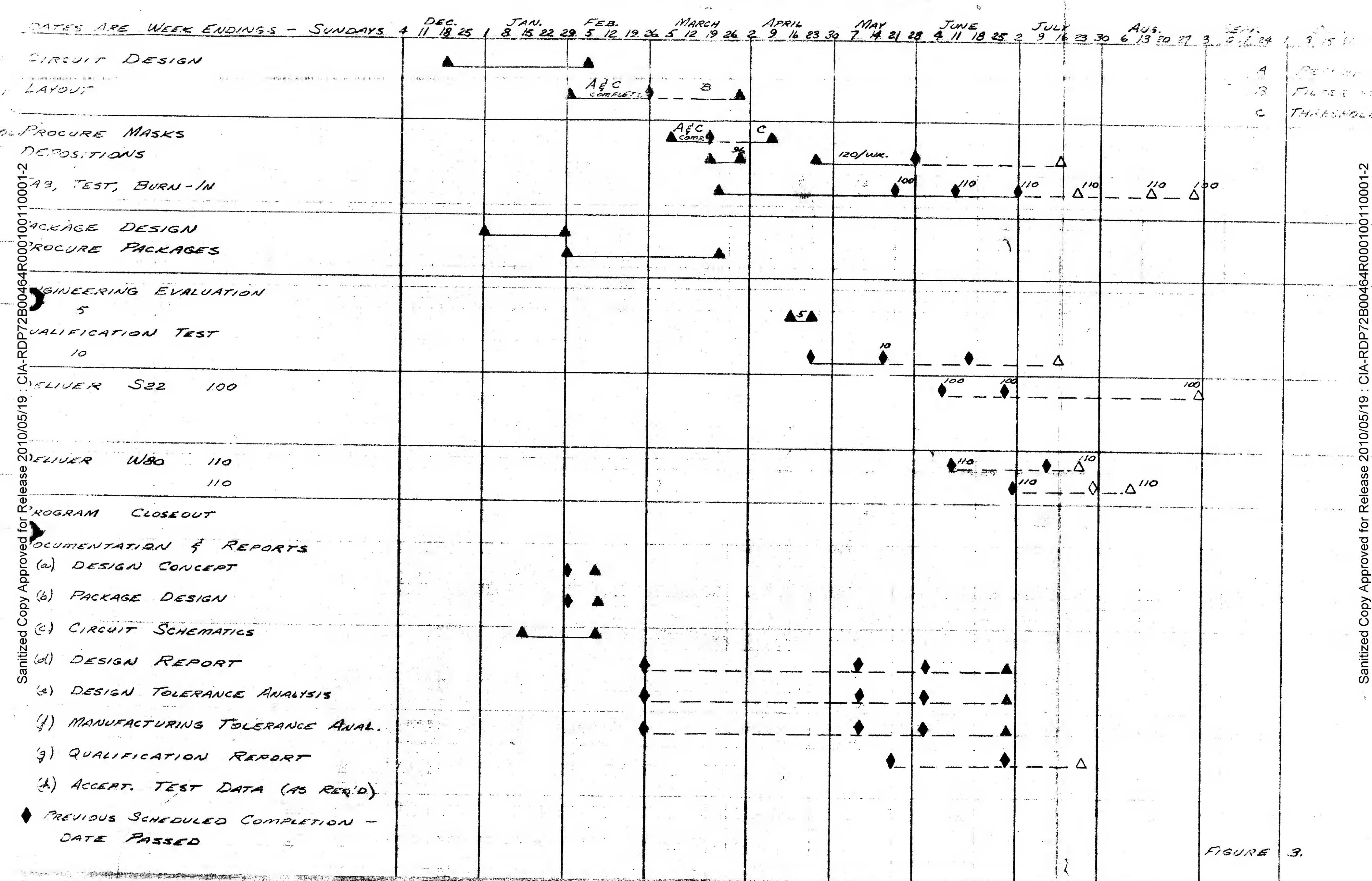

FIGURE 3.

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OSA -2794-67

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W-80

CONTRACTOR MONTHLY FINANCIAL REPORT

"HARDWARE" TYPE CONTRACT

1. Contract Number FH-2515 Task Order No. (If Any) ______
2. Financial Status as of 7/2/67 (Date)
3. Contract Performance Period From 10/28/65 To 10/15/67
4. Estimated Percentage of Work Completed 93%
5. Estimated Contract Completion Date (Basic - 12/15/67, Encoder - 12/30/67) 12/30/67
6. Contractor Planned Cumulative Expenditures to Date $ 1,280,958
7. Cumulative Actual Expenditures to Date $ 1,281,112
8. Contractor Planned Outstanding Commitments -0-
9. Actual Outstanding Commitments -0-
10. Cumulative Planned Expenditures and Outstanding Commitments to Date (6 + 8) $ 1,280,958
11. Cumulative Actual Expenditures and Outstanding Commitments to Date (7 + 9) $ 1,281,112
12. Variance - Lines 10 - 11 (+ or -) $ - 154
13. Estimate to Complete Contract $ 97,700
14. Total Estimated Amount Required to Perform Contract (7 + 13) $ 1,378,812
15. Contract Funds Allocated $ 1,312,045
16. Variance - Lines 15 - 14 (+ or -) $- 66,767
17. Additional Amount for Work Proposed, But not yet Authorized $ 119,000

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W80 INFRARED SCANNER

PROGRESS REPORT No. 19

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I INTRODUCTION

Two Infrared Systems, with the designation of W80C, are being modified to incorporate new decision logic circuits, detectors and analog circuits. The following report presents the monthly progress from 15 May to 15 June 1967. Work during this period, as in the past month, has been primarily concerned with the production of 220 analog electronic modules, the testing of assembled logic and servo cards and the wiring of system cables. A delivery slippage and cost overrun by the detector vendor still remains a problem and the current pacing item. At this time a 9-week slippage is quoted with a resultant effect of 8 weeks on the program. Cost overrun remains the same at approximately 45 percent of the initial CPIF contract.

Because of the above large slippage the Activity Flow Chart, Figure 1, has been redrawn to more clearly depict the program status. Also noted in this figure is the fact that the analog electronics is only two weeks from being a pacing item since a slippage of six weeks now exists in this area. In view of the slippage, the chart also shows a stretchout of the testing and wiring phase to provide the most efficient use of personnel and minimize secondary increased cost effects. Figure 2, the milestone chart has been updated and is self-explanatory. The analog microelectronic schedule, Figure 3, shows a delivery slippage of six weeks for W80 modules (which is given priority over S22) and can be seen to be within two weeks of becoming a pacing item in Figure 1.

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II PROGRAM STATUS

A. Subsystem Status

1. Analog Microelectronics - The present status of this effort is shown in Table I. The problems existing in this effort are as stated in the previous monthly report. The most significant problem being that of low quality masks. This has resulted in deposition yields of 10 to 20 percent rather than 80 percent experienced on other programs. The mask vendor has recently moved to new facilities and has not, at this time, attained satisfactory process control. In addition, because this effort is fixed price, work is proceeding on a cost rather than schedule emphasis.

2. Digital & Servo Logic - Table II presents the current assembly and testing status of the logic and servo cards and system wiring. Other than rescheduling of these items, in view of the over-all program, and some non-pacing problems with P. C. board delivery, there are no anticipated problems in this phase.

Work has been initiated on a redesign to incorporate elevation encoders. This is proceeding as rapidly as possible to ascertain its total effect the sector light location and the possibility of replacing the elevation tachometer. It is highly desirable to incorporate the necessary changes in gimbal design and sector lights at this time rather than some later date.

B. System Status

No work is in process at the system level.

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C. <u>Interface Status</u> - A decision has been made to make some flight evaluation tests with the W80 thermal simulation unit. As a result of a meeting with Clay and Fred on 24 May 1967 it was determined that nothing would be done until a mounting layout could be agreed upon.

D. <u>Procurement</u>

1. <u>Detector</u> - The detector vendor reports a slippage of 9 weeks on array No. 1 and 5 weeks on array No. 2. This causes an 8 week program slippage. Previously a 6 week slippage was reported. An additional 3 weeks were lost when tests showed that the first detectors mounted did not meet specifications. The assembly sequence in the final stage of manufacture is such that a fixed amount of time is required. To proceed any faster would provide a lower quality product and greatly increase the risk of further problems. For example, welding, curing recovery bake, and so on, can only proceed at a certain pace.

Although an additional 3 weeks were lost, it is reported that there are no additional costs expected over the previously stated overrun.

2. <u>Thermoelectric Cooler</u> - This item is complete as previously reported.

3. <u>Power Supplies</u> - Delivery of this item was scheduled for 1 June. Estimated delivery is now 20 June on this fixed price contract with no reported problem areas.

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E. Fabrication Status - Pod modifications have been completed for one system except for the TE cooler heat sink strap. The heat sink modification will be made when the telescope and detector assembly is available.

F. Assembly Status - One system cable assembly is 90 percent complete and the second assembly is approximately 25 percent complete. The latter cable assembly is not scheduled for completion until 28 July.

G. Analytic and Test Data - MTBF calculations have been made for the analog circuits and a system MTBF value is now being established. Other test data on the analog modules is available and is inth e process of being released; however, manufacturing problems are given priority and so the report is taking much longer than scheduled.

H. Technical Conferences - Clay and Al visited Fred, 24 May 1967, Subject: W80 Thermal Evaluation Tests (see Section C - Interface).

III PROBLEM AREAS

1. The detector vendor now quotes a 9 week slippage with overrun costs the same, about 45 percent of the basic contract.

2. Poor analog electronic masks and their resultant low deposition yield have primarily been the cause of this area slipping to within 2 weeks of being a pacing item.

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TABLE I

ANALOG MICROELECTRONIC STATUS

	PreAmp-Filter	AGC	Threshold
Circuit Design	(c) complete	(c) complete	(c) complete
Package Design	(c)	(c)	(c)
Worse Case Analysis	(c)	(c)	(c)
Mask Fabrication	(c)	(c)	(c)
Deposition & Test	55%	21%	28%
Component Delivery	90%	100%	90%
Assembly	44%	11%	23%
Module Status	11 units		

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TABLE II

W80 ASSEMBLY & TEST STATUS (EXCLUDING ANALOG CIRCUITS)

	System 1		System 2	
	Assembled	Tested	Assembled	Tested
A. Digital & Servo Assy				
1. Az Servo (1 Bd)	X	X	X	X
2. El Servo (1 Bd)	X	X	X	X
3. Scan Patt (3 Bd)	X	X	1 PC Bd nod del	66%
4. Sig. Proc. & Del (1 Bd)	X	50%	X	None
5. Targ. Size Disc (2 Bd)	X	50%	X	None
6. Targ. Stor & Val. (2 Bd)	X	None	X	None
7. Sector Tim & Gates(1 Bd)	X	None	X	None
B. Power Supplies	Due 6/15	None	Due 6/15	None
C. System Cabling	90%	None	25%	None
D. Scanner Mod.	X	-	None	-
E. Detectors	Due 5/14	Sched. 6/26	Due 6/10	Sched. 7/
T E Cooler	X	X	C	X

(C) - Completed

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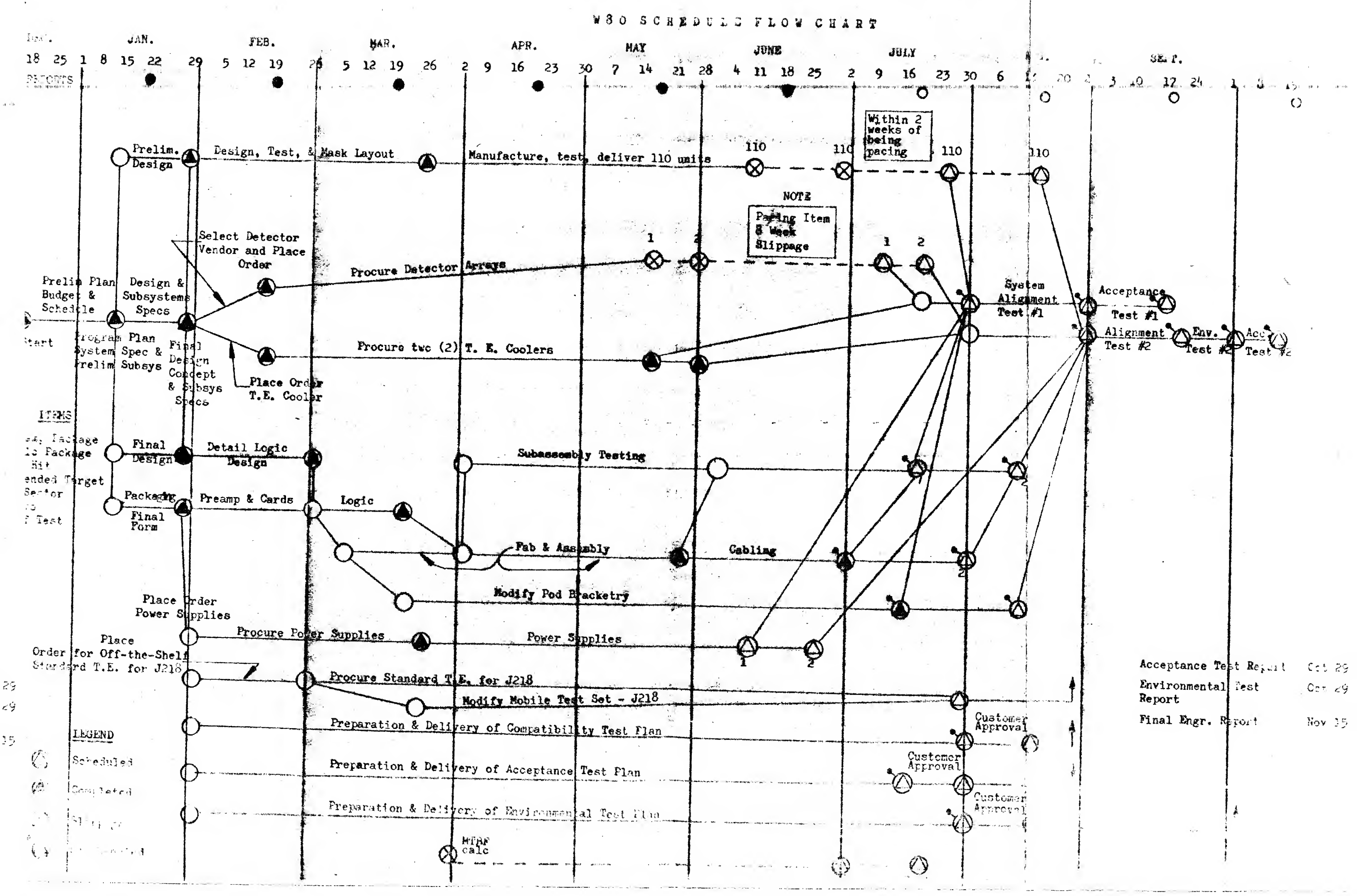

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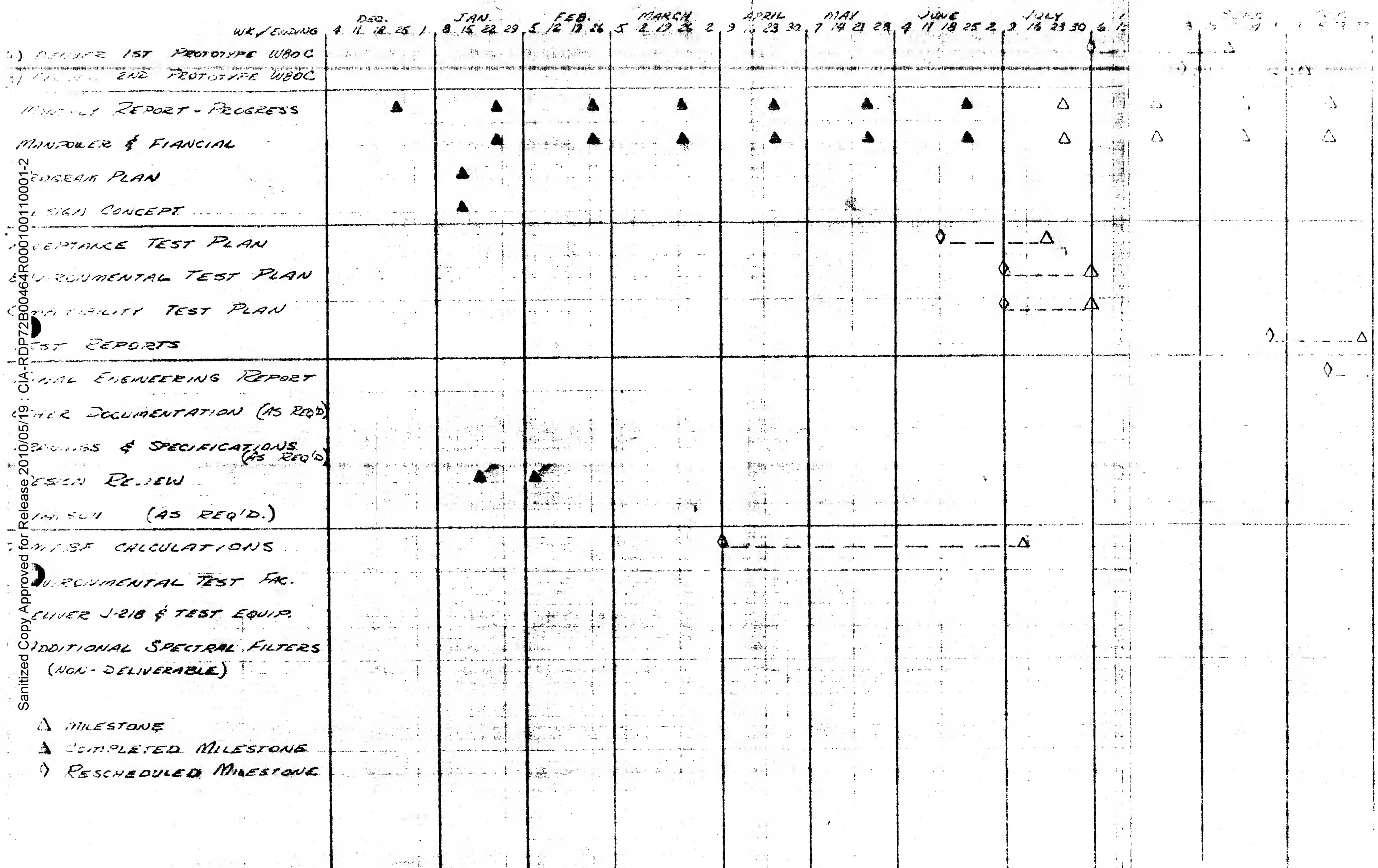
W80 MILESTONE CHART



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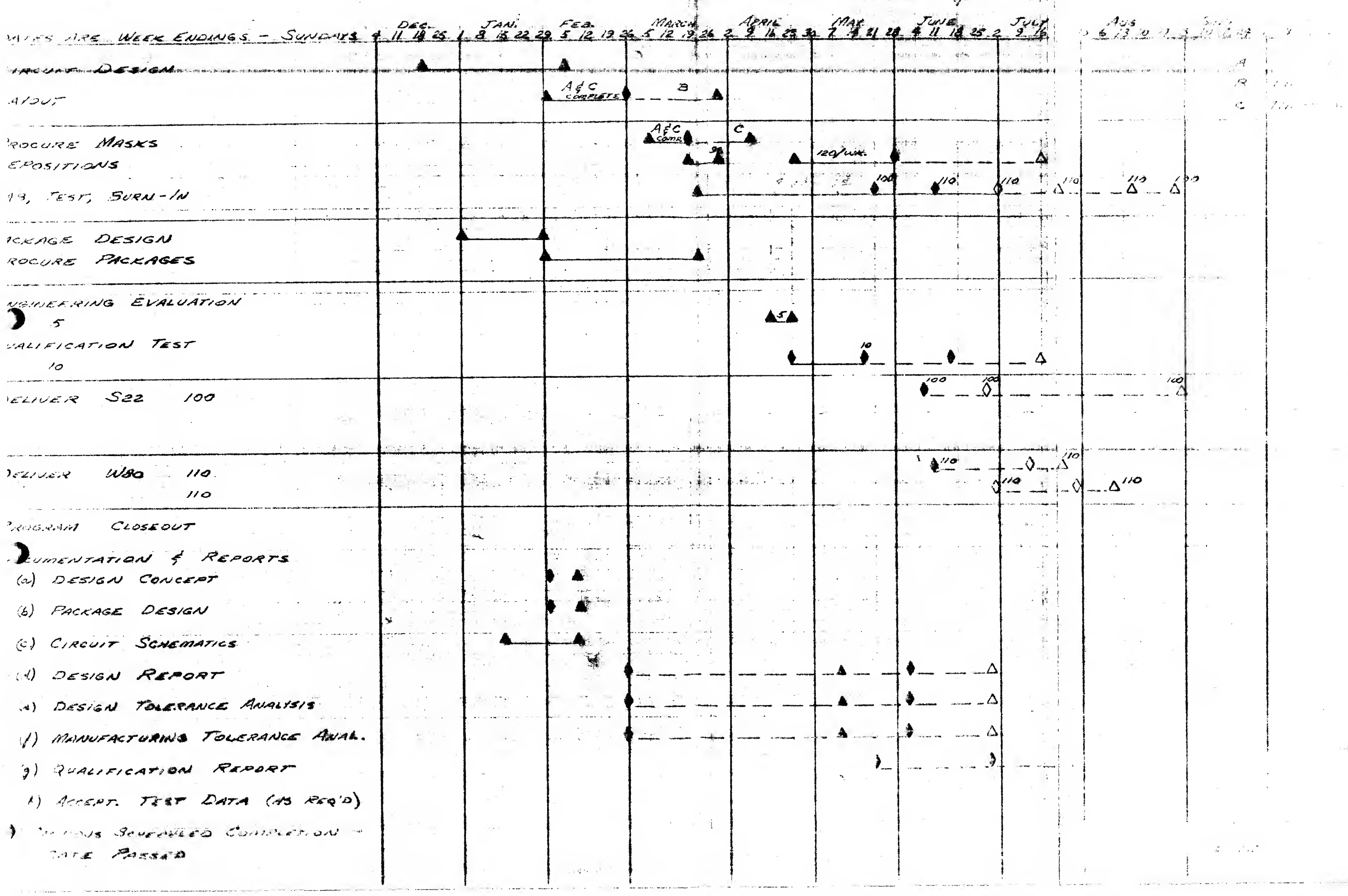
S22 & W80 ... ELECTRONICS SCHEDULE



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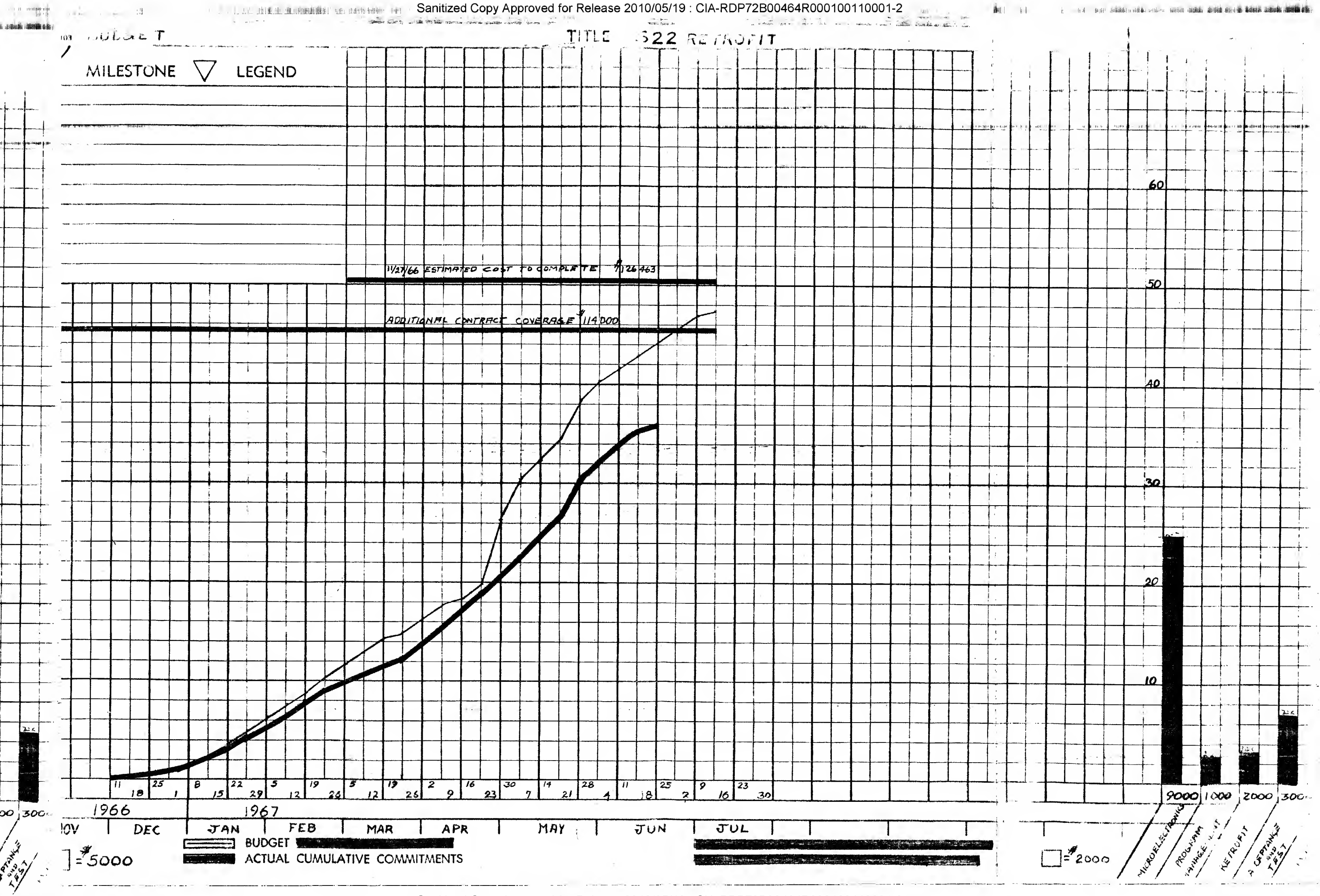

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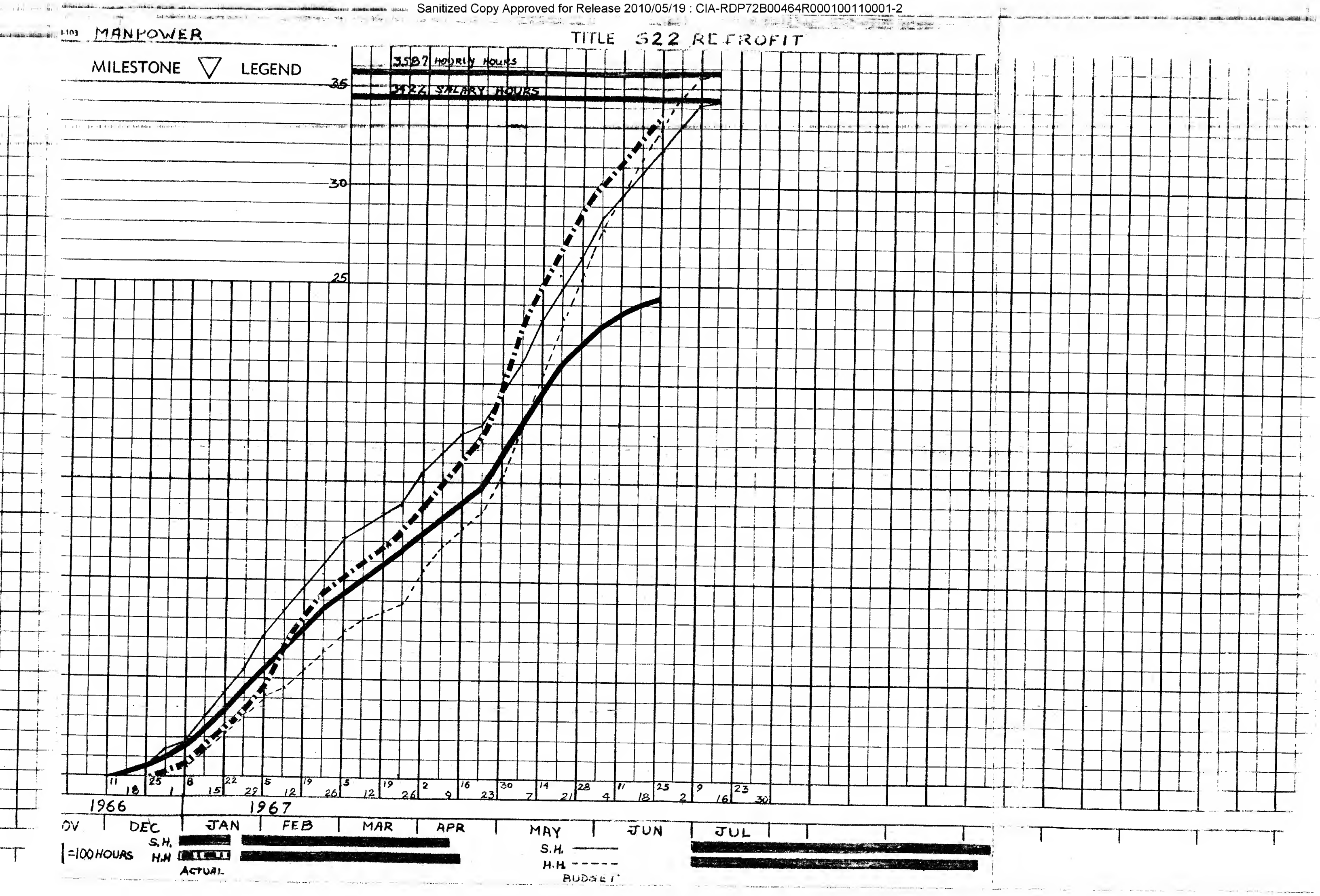

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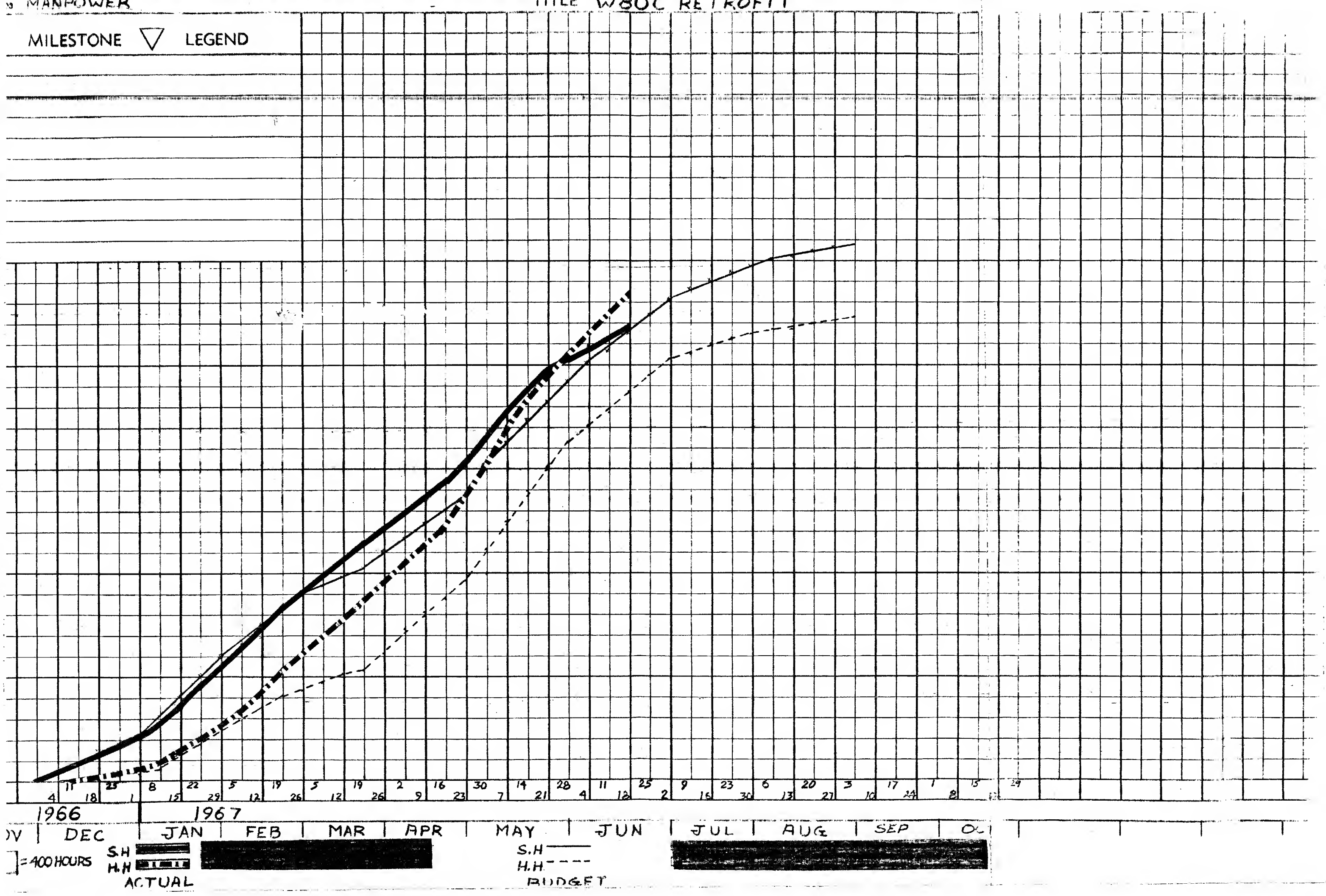
MANPOWER

TITLE W80C RETROFIT



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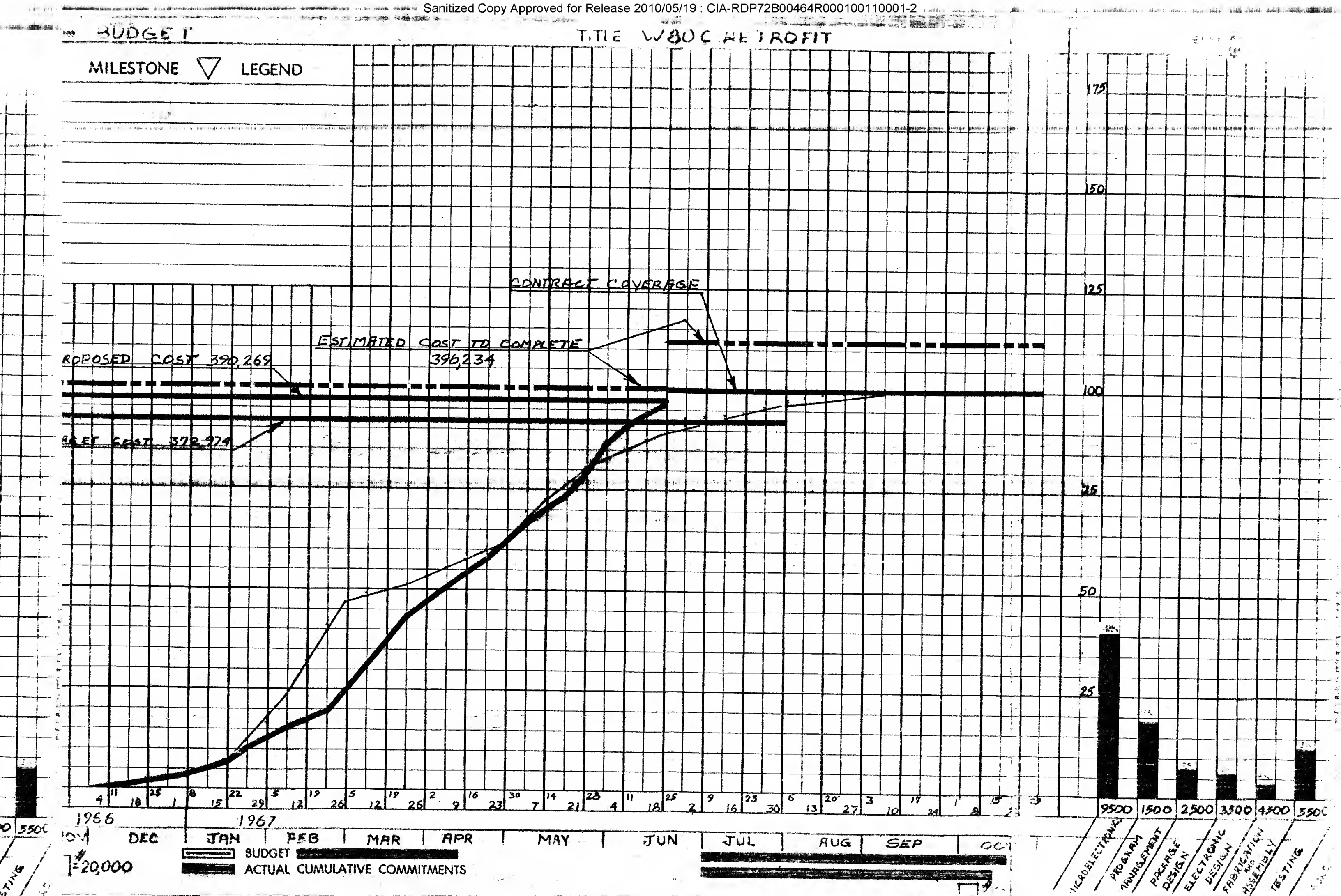

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W80C INFRARED SCANNER

PROGRESS REPORT No. 18

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I INTRODUCTION

The following report presents the monthly progress from 15 April to 15 May 1967 on a redesign and retrofit of two W80C Infrared Systems. Work during this period has primarily been concerned with the production of 220 analog electronic modules, the testing of assembled digital and servo cards and the wiring of system cables. Considerable time was also spent resolving problems in detector manufacture because of a vendor delivery slippage of six weeks with an over run in costs.

The activity flow chart of Figure 1 has been updated to note slippage in two areas. These slippages are: detectors, 6 weeks; and analog electronics, 4 weeks. At this point in time the detectors are the pacing item and will reflect a 5 to 6 week slippage in final system delivery. Project schedules are presently being reworked in an effort to prevent this slippage from having a secondary effect on costs and schedules of other program work in process. Figure 2, the milestone chart, has been updated and is self-explanatory. The analog microelectronic schedule of Figure 3, reflects a slippage of 4 weeks in the delivery of all required modules.

II PROGRAM STATUS

A. Subsystem Status

1. Analog Microelectronics - The present status of this effort is shown in the following table:

	Preamp-Filter	Age	Threshold
Circuit design	(c) complete	(c) complete	(c) complete
Package design	(c)	(c)	(c)
Worse case analysis	(c)	(c)	(c)
Mask fabrication	(c)	(c)	(c)
Deposition and test	52%	6%	19%
Component delivery	75%	100%	100%
Assembly	11%	6%	8%
Module	2 engineering evaluation units		

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Three problems, other than masks, have shown up in production, and these are:

a. Input Transistor - Some difficulty has been experienced in vendor delivery of low noise input transistors. These problems are now claimed to be under control and Amelco has more than 500 in the process of being shipped. Flip-chip devices have not shown consistent low noise performance comparable to the moly-tab devices used in the past.

b. Zener Regulator Stage - Components from one vendor exhibited an excessive amount of noise at low currents. Device parameters for this stage thus had to be more clearly specified.

c. R-C Roll Off - Low frequency roll-off of the production AGC units were consistent; however, at a slightly higher frequency than the worse case design tests indicated. Although this will have a negligible effect on the W80C filter characteristics, it does affect the intended use of the AGC section with other systems. Changes are now in process to place the R-C roll off frequencies under proper control.

2. Digital Logic - Printed circuit board assembly is now complete on all 22 cards and testing has been initiated on the individual boards. To date the elevation servo boards have been checked out and the azimuth servo boards are now being tested. Testing of the remaining card assemblies will be stretched out through the month of June so as to phase in with

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the detector schedule with a reasonable program plan.

B. System Status

No work is in process at the system level at this time.

C. Interface Status

A preliminary interface document has been completed and will be submitted for review.

D. Procurement Status

1. Detector Procurement - Delivery schedule on the two detector arrays has slipped 6 weeks and resulted in a 40 per cent increase in costs. ECA attributes their difficulty to start up and learning problems since their previous effort, failure of a vendor to deliver acceptable masks, and problems associated with the potting compound wicking up the cable pack thus preventing cable flexibility. Previous wicking problems were so bad that some assemblies were almost impossible to use. These various problems now appear to be well under control and are being monitored daily by a resident QC man available from another program.

2. Thermoelectric Cooler - All four units were delivered on 14 May 1967. Acceptance tests showed these units would perform satisfactorily providing adequate heat sinking is accomplished to the pod skin. A temperature differential of 15 degrees centigrade was attained for a heat load of 2.5 watts.

3. Power Supplies - Delivery of these units is scheduled for 1 June 1967. There are no reported slippages and mockups have been inserted in the pod to confirm the over all configuration.

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E. Fabrication Status

Some preliminary work has started on pod modification by removing interferring structures from the old design. Mockups of the new packages have been checked out and pod modification will now proceed.

F. Assembly Status

Cable harness wiring is now in process and will continue through June for both systems.

G. Analytic Test Data

Analog microelectronic test data has been submitted and it is now being reworked in a more useful form. In addition, MTBF calculations of the analog module are in process.

H. Technical Conferences

STAT

[redacted] visited Al and John, 17 May 1967; Subject: Program review.

III PROBLEM AREAS

1. Detector vendor six week slippage and 40 percent cost over run; a pacing item.

2. Analog electronics requires vendor delivery of acceptable low noise field effect transistors.

3. Poor microelectronic deposition masks from a vendor have caused the deposition yield to be about half of what has been experienced in the past.

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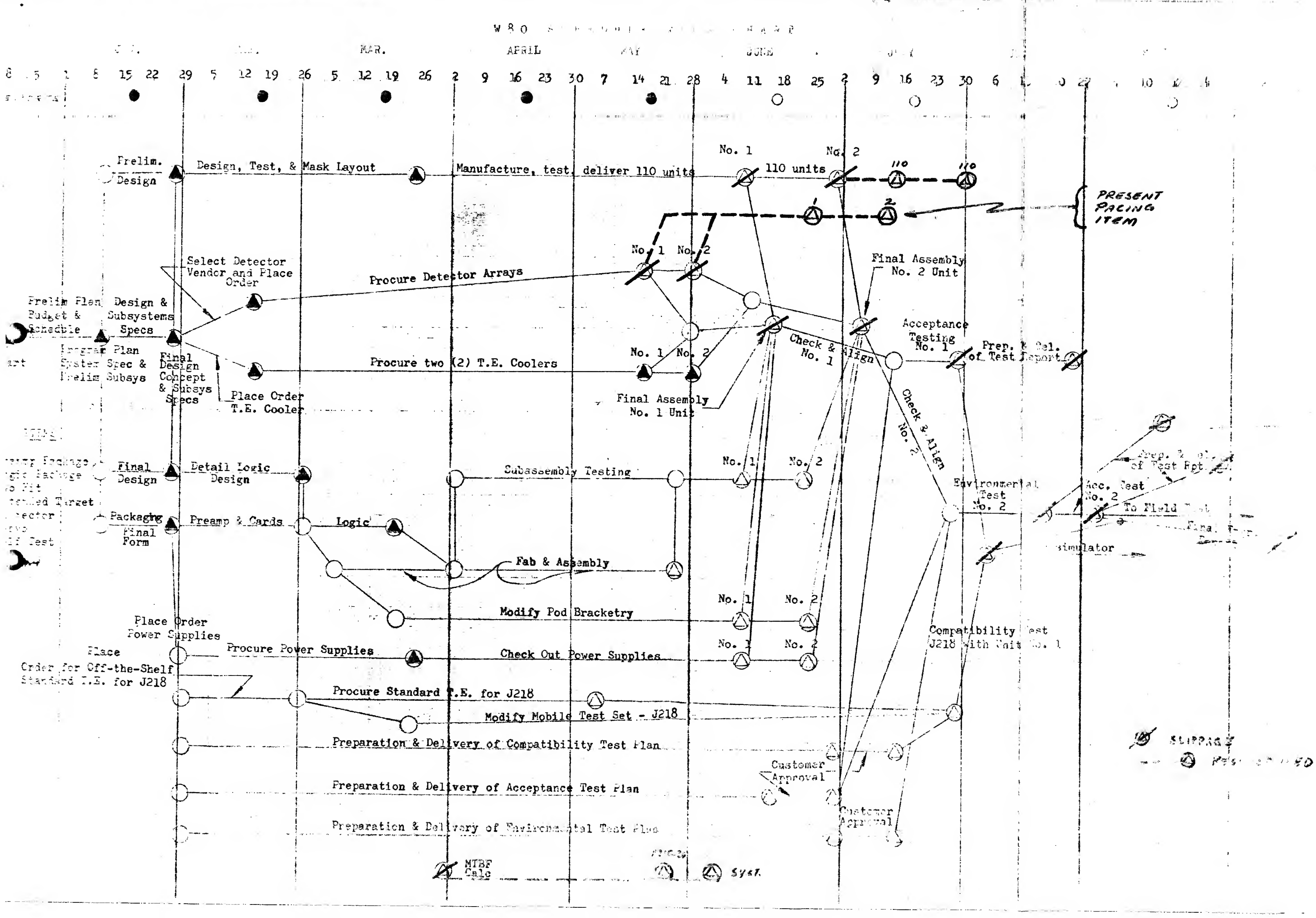

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WSO MILESTONE CHART

WK/ENDING: DEC. 4, 11, 18, 25 · JAN 1, 8, 15, 22, 29 · FEB. 5, 12, 19, 26 · MARCH 5, 12, 19, 26 · APRIL 2, 9, 16, 23, 30 · MAY 7, 14, 21, 28 · JUNE 4, 11, 18, 25 · JULY 2, 9, 16, 23, 30 · AUG. 6, 13, 20, 27 · SEPT. 3, 10, 17, 24 · OCT. 1, 8, 15, 22

(a) DELIVER 1ST PROTOTYPE WBOC
(b) DELIVER 2ND PROTOTYPE WBOC

MONTHLY REPORT - PROGRESS
MANPOWER & FINANCIAL
PROGRAM PLAN
DESIGN CONCEPT

ACCEPTANCE TEST PLAN
ENVIRONMENTAL TEST PLAN
COMPATIBILITY TEST PLAN
TEST REPORTS

FINAL ENGINEERING REPORT
OTHER DOCUMENTATION (AS REQ'D)
DRAWINGS & SPECIFICATIONS (AS REQ'D)
13 DESIGN REVIEW P F
14 LIAISON (AS REQ'D.)

15 ...T.S.F CALCULATIONS
16 ENVIRONMENTAL TEST FAC.
17 DELIVER J-218 & TEST EQUIP.
18 ADDITIONAL SPECTRAL FILTERS (NON-DELIVERABLE)

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S22 & W80 MICROELECTRONICS SCHEDULE

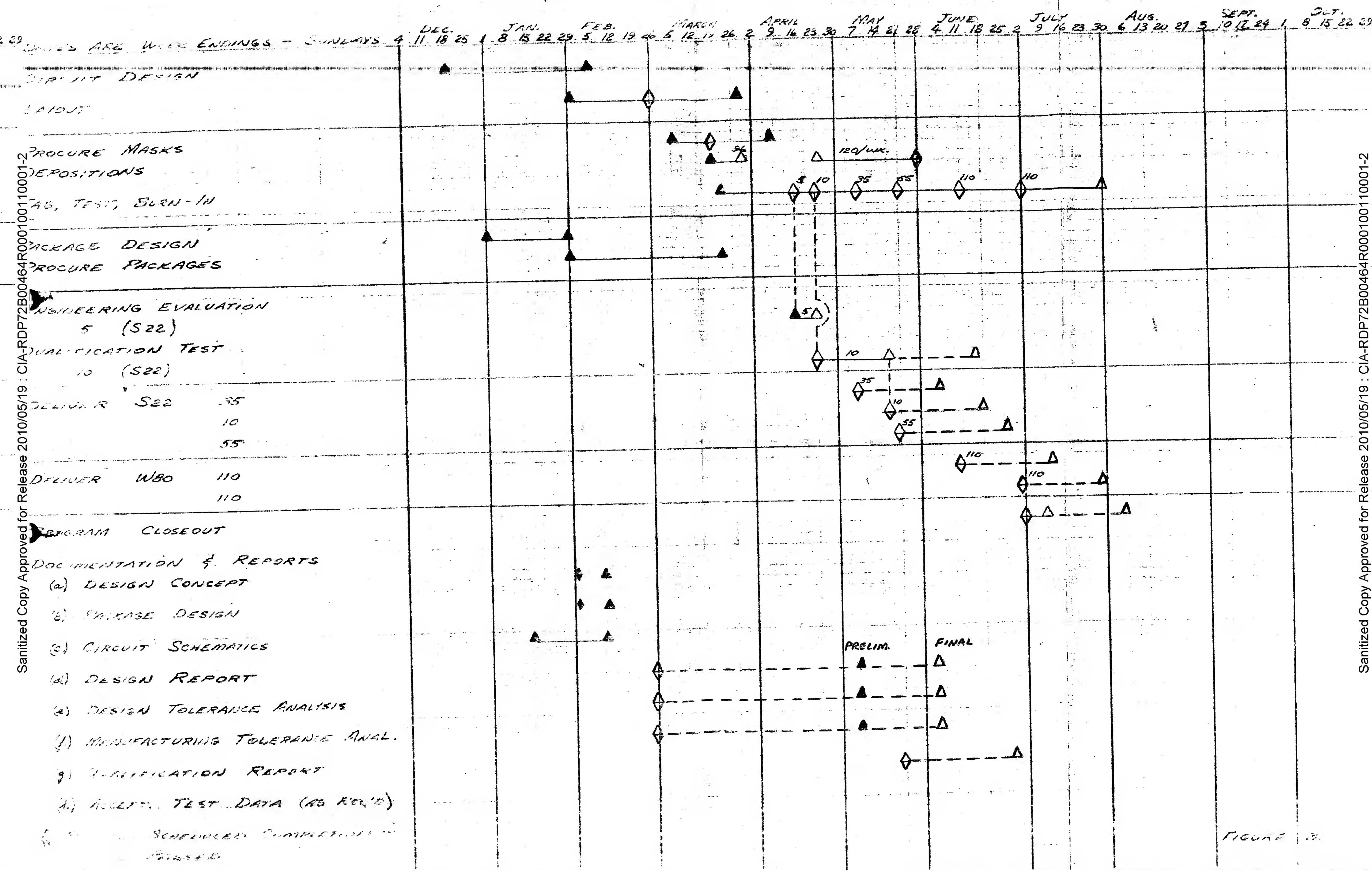

FIGURE 3.

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W-80 INFRARED SCANNER

PROGRESS REPORT No. 17

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I INTRODUCTION

The following report presents the monthly progress from 15 March to 15 April 1967. The activity flow chart, Figure 1, notes completion of the microelectronic masks and logic packaging. As may be noted from this chart, work during the latter portion of this report period and until the end of May is primarily concerned with fabrication and assembly. MTBF calculations have been rescheduled because of a slippage in final microelectronic design test data. Figure 2, the milestone chart of deliverable program items is self-explanatory. The analog microelectronic schedule, shown in Figure 3, reflects an over all slippage of about 3 weeks in considering completed tasks. Manufacturing has been rescheduled at this time to absorb this slippage.

II PROGRAM STATUS

A. Subsystem Status

1. Analog Microelectronics - The present status of the microelectronic effort is summarized in the following table.

	Preamp	Agc	Threshold
Circuit Design	Complete	Complete	Complete
Tolerance Analysis	Complete	Complete	Complete
Mask Layout	Complete	Complete	Complete
Mask Procurement	Complete	Complete	Complete
Package Design	--	Complete	--
Package Procurement	--	Complete	--

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	Preamp	Agc	Threshold
*Active Device Procurement	--	(Partial)	--
Design Reports	--	In review	--
Deposition (% complete)	58%	0	17%
Assembly	0	0	0

* Delivery of these components is somewhat unpredictable and this could become a critical pacing item.

2. Digital Logic - Partial delivery of the printed circuit cards has been made and work is now in process loading the boards with components for wave soldering. Some of the PC boards are not of as high a quality as desired. Some of these are being rejected, however, any resulting delays should not affect the program.

B. System Status

No work is in process at the system level at this time.

C. Interface Status

Electrical interface plugs and pin assignments have been established. A conference is planned with vehicle personnel in the near future.

D. Procurement Status

1. Detector Procurement - ECA has indicated that they may be two weeks late in delivery. Cause for this slippage was late delivery of detector masks and these then, were unacceptable. ECA has gone ahead by making their own masks and now have cell arrays ready for evaluation. Acceptable units will be

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mounted on their heat sinks and then interconnected to the wire packs.

2. <u>Thermoelectric Cooler</u> - This procurement with EG&G is on schedule and the coolers should be ready for acceptance tests by 1 May 1967. A decision may be made to delay these tests such that they concur with the detector acceptance tests since both vendors are in the same geographic area.

3. <u>Power Supplies</u> - Delivery of the power supplies is scheduled for 1 June 1967.

E. <u>Fabrication Status</u>

At present the only fabrication in process is in micro-electronic manufacturing. Here, depositions are approximately 20 percent completed.

F. <u>Assembly</u>

Microelectronic substrate assembly will commence in one week. Digital logic boards are in the process of being loaded for soldering. Test cable assemblies are being assembled for testing subsystem logic assemblies.

G. <u>Analytic Test Data</u>

Test data obtained on the analog microelectronics is presently being compiled and reviewed. In addition, preliminary cell data on noise and bias has been promised by 1 May 1967.

H. <u>Technical Conferences</u>

STAT

[redacted] visited Bob and Al, 4 April 1967, Subject: Proposed W-80 target angular rate measurement and program review.

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III PROBLEM AREAS

Transistor flip-chip procurement remains a critical and pacing item. An extended effort is still required in an attempt to assure components as they are required for production.

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W 8 0 SCHEDULE FLOW CHART

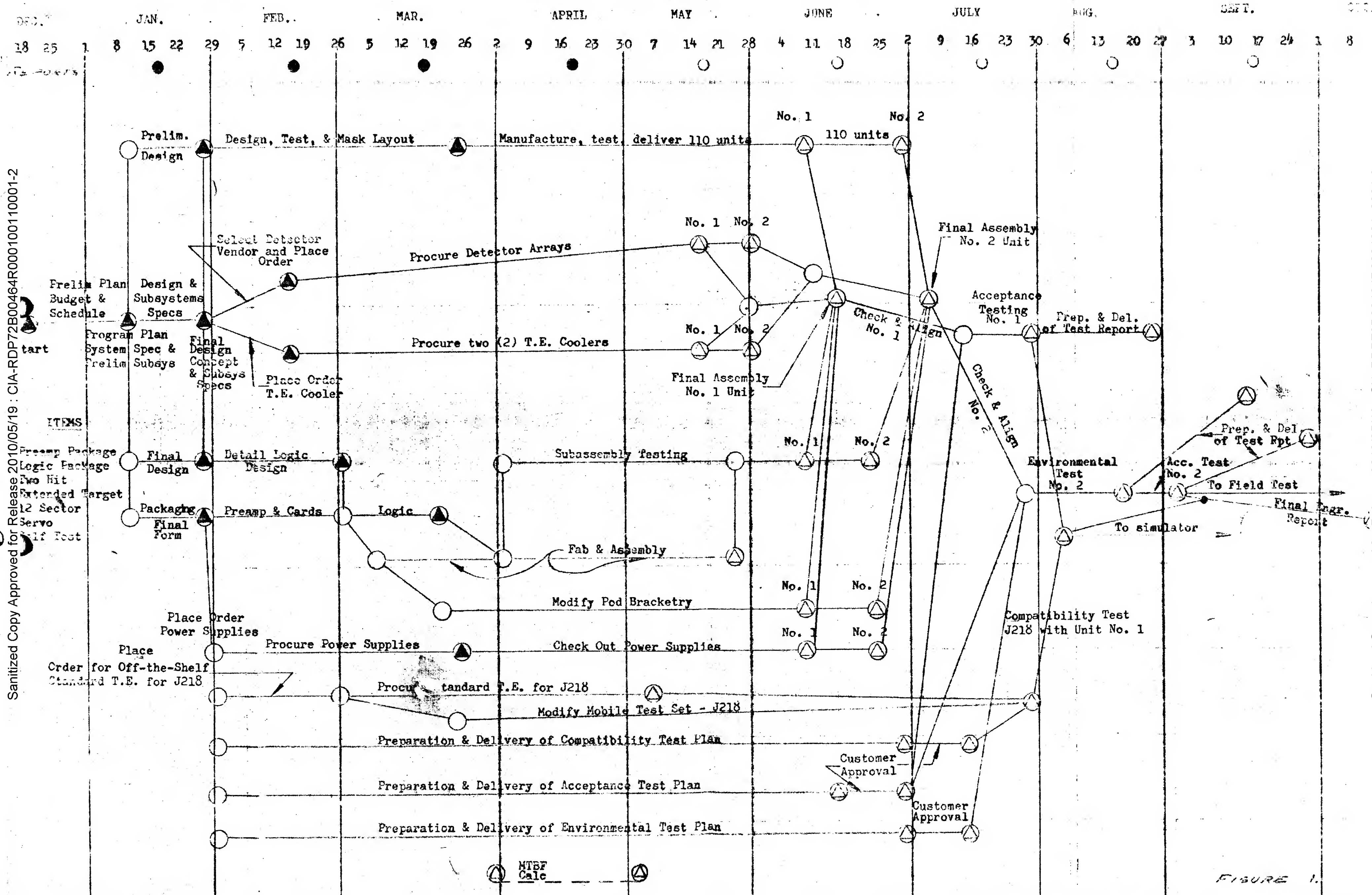

FIGURE 1.

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W80 MILESTONE CHART

WK/ENDING	DEC. 4 11 18 25 1	JAN. 8 15 22 29	FEB. 5 12 19 26	MARCH 5 12 19 26 2	APRIL 9 16 23 30	MAY 7 14 21 28	JUNE 4 11 18 25 2	JULY 9 16 23 30	AUG. 6 13 20 27 3	SEPT. 10 17 24 1	OCT. 8 15 22 29
1.(a) DELIVER 1ST PROTOTYPE W80C									△		
1.(b) DELIVER 2ND PROTOTYPE W80C									△		
2. MONTHLY REPORT - PROGRESS	▲	▲	▲	▲	▲	△	△	△	△		
3. MANPOWER & FIANCIAL		▲	▲	▲	▲	△	△	△	△		
4. PROGRAM PLAN		▲									
5. DESIGN CONCEPT		▲									
6. ACCEPTANCE TEST PLAN							△				
7. ENVIRONMENTAL TEST PLAN								△			
8. COMPATIBILITY TEST PLAN								△			
9. TEST REPORTS										△	
10. FINAL ENGINEERING REPORT											△
11. OTHER DOCUMENTATION (AS REQ'D)											
12. DRAWINGS & SPECIFICATIONS (AS REQ'D)											
13. DESIGN REVIEW		▲P	▲F								
14. LIAISON (AS REQ'D.)											
15. MTBF CALCULATIONS					△						
16. ENVIRONMENTAL TEST FAC.											
17. DELIVER J-218 & TEST EQUIP.											
18. ADDITIONAL SPECTRAL FILTERS (NON-DELIVERABLE)											

FIGURE 2

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S22 & W80 MICROELECTRONICS SCHEDULE

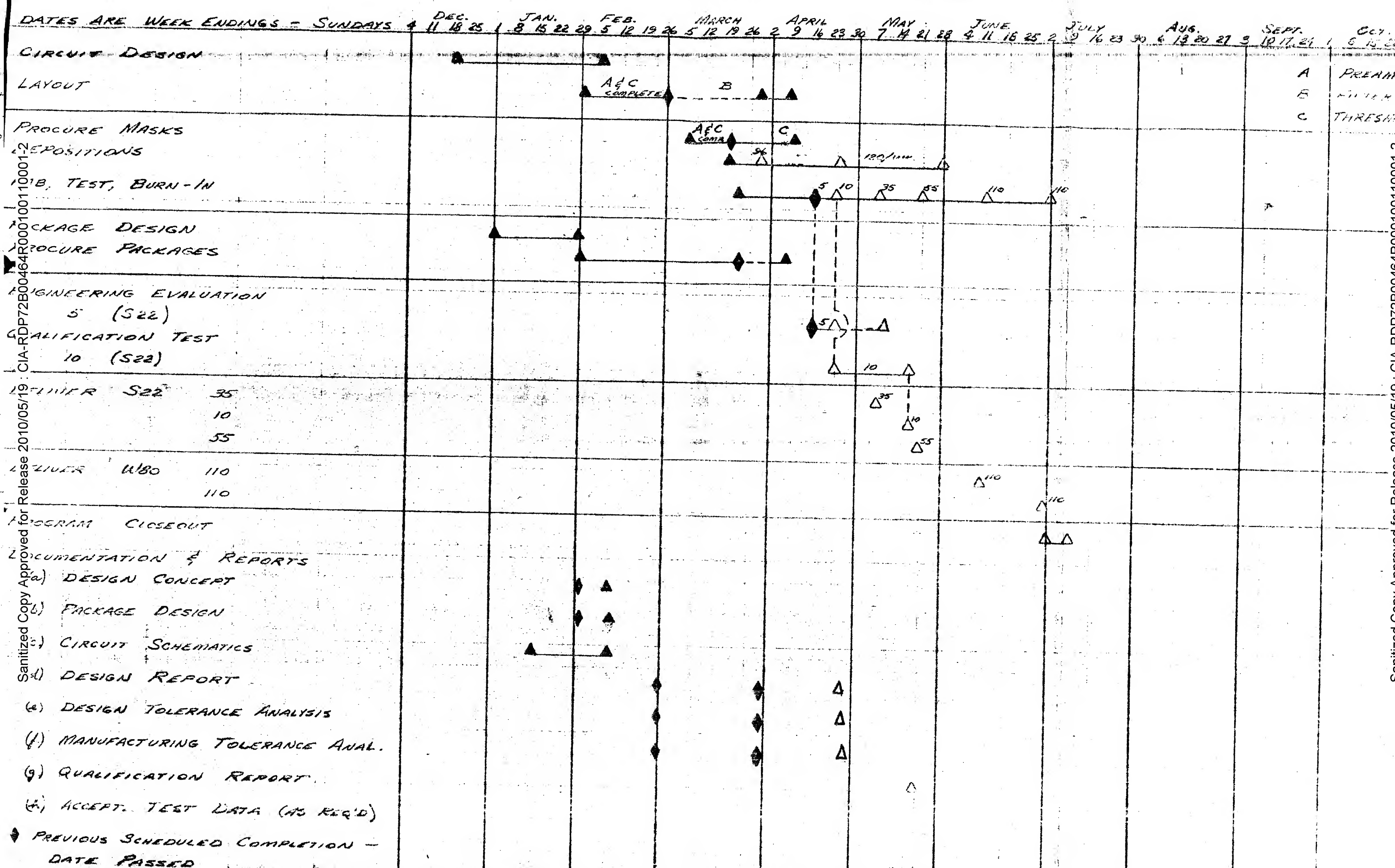

FIGURE 3

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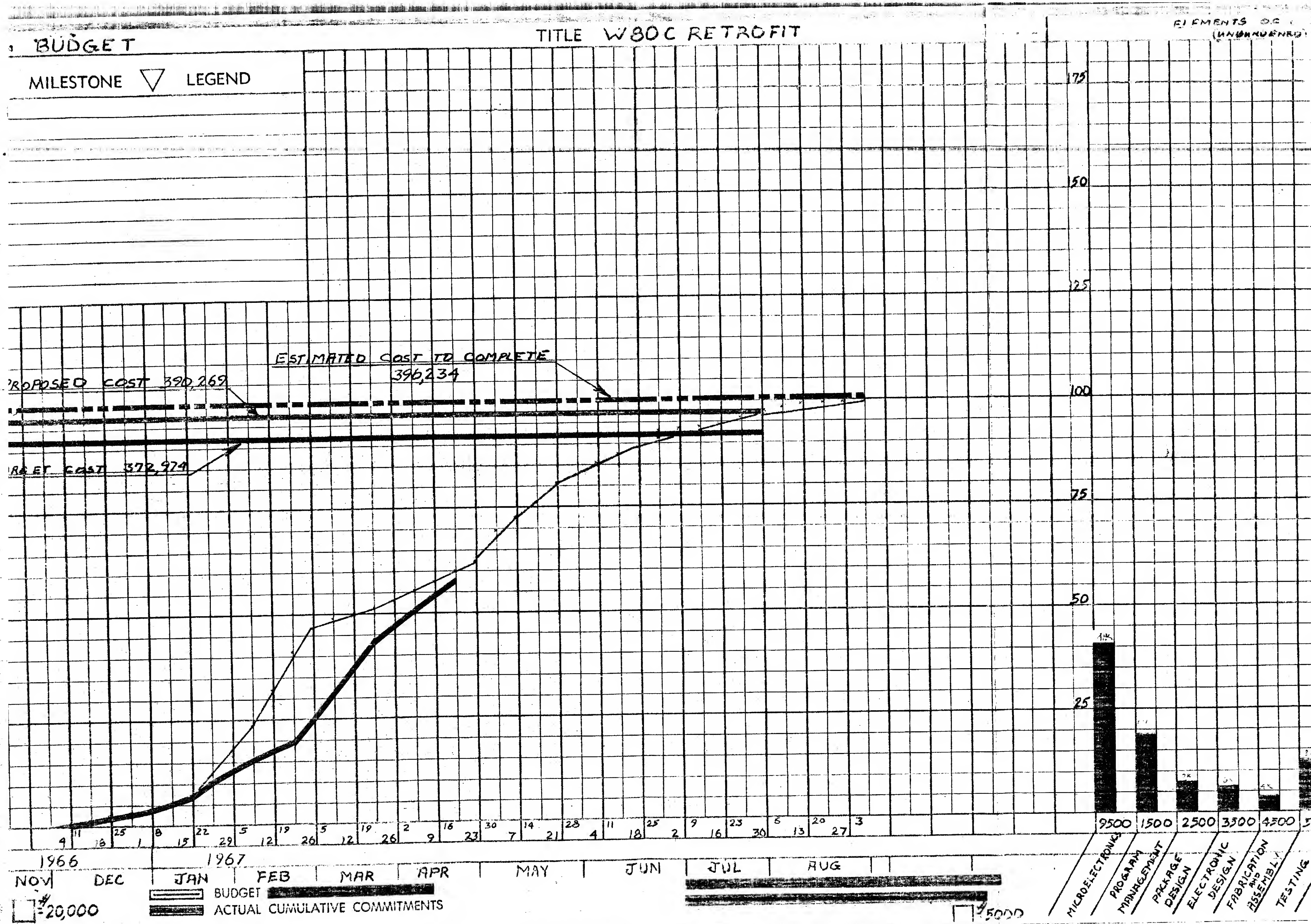

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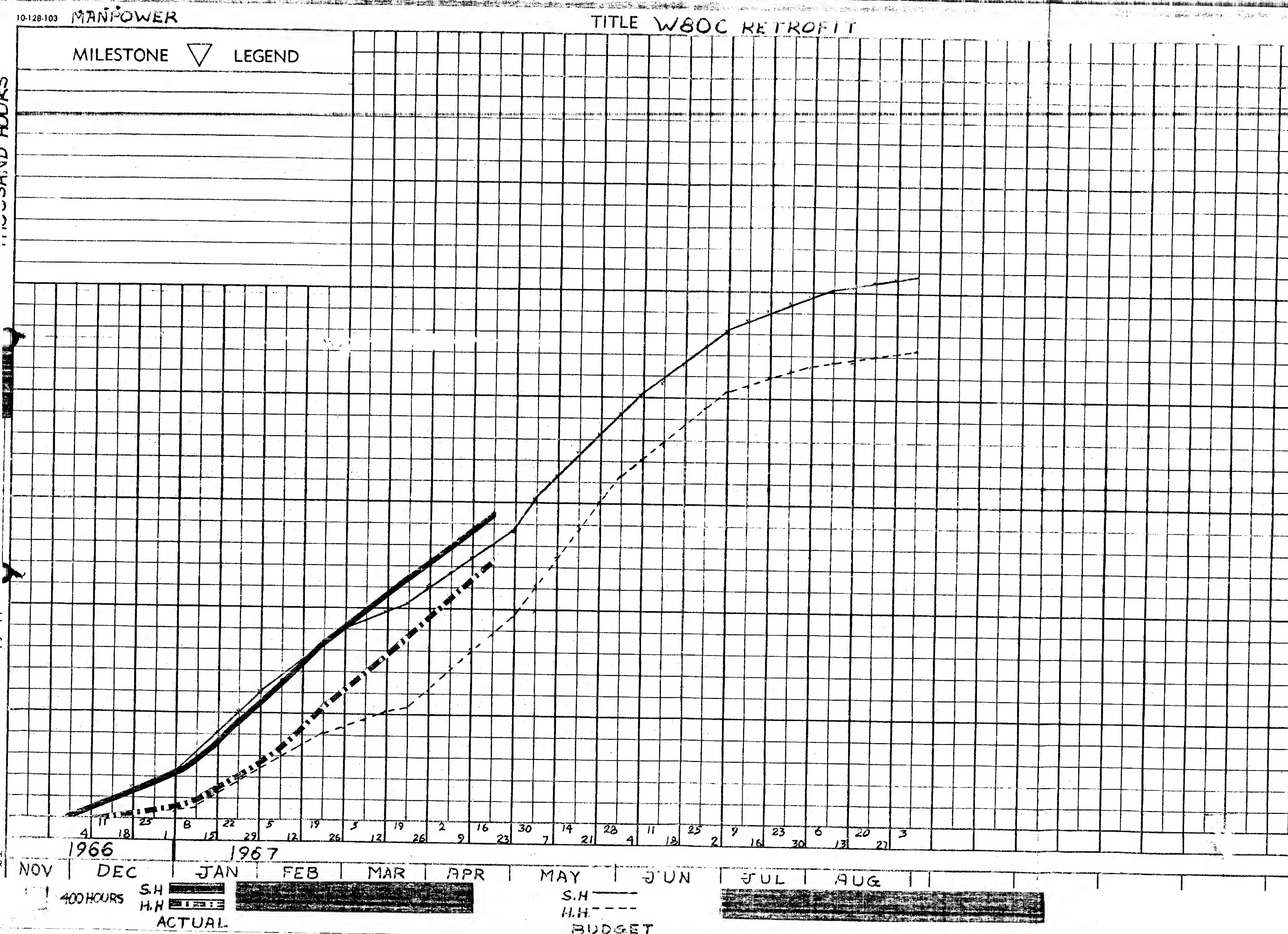

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W-80 INFRARED SCANNER

PROGRESS REPORT NO. 16

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I INTRODUCTION

The following report presents the monthly progress from 15 February to 15 March 1967. Work during this period has mainly been concerned with completing the digital circuit board designs for procurement, freezing the microelectronic design and initiating procurement of the power supplies.

The activity flow chart, Figure 1, has been updated to show completion of the logic design and procurement initiation of the thermoelectric coolers and power supplies. Figure 2, the milestone chart, which reflects deliverable program items, has been updated and is self-explanatory. The analog microelectronic schedule of Figure 3, reflects a slippage in the mask layout, mask procurement and design reports. These resulted from certain required design changes in the filter-agc section (B on the chart) to satisfy worse case evaluations. Budgets and schedules are presently being reworked to absorb this slippage.

II PROGRAM STATUS

A. Subsystem Status

1. Analog Microelectronics - The microelectronic circuitry has been separated into three functional parts for manufacture. These are the preamplifier, the filter-agc and the threshold sections. The present status of this effort is as shown in the following table:

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	Preamp	Filter-Agc	Threshold
Circuit Design	Complete	In final test	Complete
Tolerance Analysis	Complete	In final evaluation	Complete
Mask Layout	Complete	95% complete	Complete
Mask Procurement	Complete		Complete
Package Design	Complete	--	--
Package Procurement	In process	--	--

Some difficulty is being experienced in the delivery schedules of flip-chip transistors. At present there are enough available components for initial production; however, further slippages cannot be tolerated. Concentrated liaison is currently being carried out with the vendors in an attempt to alleviate this potential problem area.

2. Digital Logic - Digital design and tests have been completed. Packaging is very nearly complete, with the main effort being devoted to the final checking of printed circuit board layouts prior to procurement. Seven of the eleven boards have been released.

B. System Status

No work is in process at the system level at this time.

C. Interface Status

A preliminary interface document has been delayed at this time due to higher priority schedule items.

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D. Procurement Status

1. Detector Procurement - The detector arrays are in process and on schedule.

2. Thermoelectric Cooler - A procurement has been placed with EG&G with no expected delivery problems.

3. Power Supplies - Procurement of the power supplies is in process with Wilorco. Although this company is currently experiencing a peak work load, it is not anticipated that their delivery will be a pacing item.

E. Fabrication Status

Not yet scheduled.

F. Assembly Status

Not yet scheduled.

G. Analytic Test Data

Data presently available will not be final or conclusive on the analog circuits until final release of the filter-agc section.

H. Technical Conferences

STAT

[redacted] visited Bob and Al, 28 February 1967, Subject: W-80 growth potential including target angular rate data. Clay stated he would like to have a proposed approach by 15 March 1967. This is currently in process, however, the completion date has slipped to 27 March because of limited personnel availability during this time period.

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III PROBLEM AREAS

A potential problem area exists in microelectronic transistor flip-chip procurement. Vendor slippage of delivery schedules has left little slack in this area. A concentrated effort is now in process with the two vendors (Amelco and Union Carbide) in an attempt to prevent further slippages.

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Act

TEST PLANS FOR THE W80C EMPLOYING THE MODEL J218 TEST EQUIPMENT

INTRODUCTION

During operational use, the W80C Infrared Scanner will be subjected to tests and servicing as follows:

1. Pre-use test (self-test)
2. Pre-flight or flight line testing
3. Periodic testing and calibration (bench testing)
4. Trouble shooting and repair

The pre-use test is performed with "self-test" circuitry integrally designed into the W80C system. This is an in-flight test performed at the operator's discretion. The detector array must be cooled for a successful self-test, which means that the vehicle and pod must have been in an ambient of -40°C or colder for an hour or more. The test is accomplished by the operator pushing the self-test button on his control panel. A successful test is indicated by lights on the display panel. Time for test is 17 seconds. Subsystems checked by the self-test are as follows:

1. Analog - The number of operating channels must exceed a preset threshold.
2. Servo - Azimuth and elevation servos must be functioning.
3. Digital - Steering logic must be functioning and the timers working.
4. Display - Display lights are checked.
5. Detector Temperature - This must be in correct range for the self-test to be successful.

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The J218 test equipment is not involved in the W80C self-test or pre-use test. This test is described in this test plan in order to better convey the test mission of the J218 test equipment. The J218 is involved in pre-flight testing and periodic bench testing, and can be used in trouble shooting and repair of the W80C

This test plan covers the use of the J218 in performing pre-flight tests and periodic bench testing on the W80C. In the following discussion, these tests will be itemized, the J218 test equipment will be described, and the use of the J218 in performing these tests will be detailed.

Pre-Flight Testing

These tests are not performed on a periodic basis, but rather prior to each flight in which the W80C will be used. These tests are accomplished on the flight line with the W80C mounted to the vehicle.

The tests accomplished on the W80C during flight-line or pre-flight checkout are as follows:

1. A self-test check is conducted.
2. Power supply voltages are checked.
3. Channel count and reference level are checked.
4. The self-test interlock is bypassed so that audio tone and contact closures are checked.
5. Tone level is adjusted, if required.
6. The scan generator is checked, along with servo response time and frame time.
7. The dessicator is checked after flight-line tests are complete, and the element changed, if required.
8. A general visual check is made.

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Periodic Bench Testing

The periodic testing and calibration, or bench tests, will be performed with the W80C removed from the vehicle and in the laboratory. Such tests will be performed on a periodic basis, with the period set at two months until sufficient history has been built up to warrant a change in this period. Calibration is a part of this test, so that upon completion of the procedure the unit is in good working condition and also calibrated.

Estimated time for disassembly, test, calibration and reassembly into the vehicle, is three to four working days. After being reinstalled in the vehicle, a normal self-test will be performed.

Tests performed on the W80C during periodic test and calibration are as follows:

1. Flight line tests are repeated.
2. The heater blanket thermostat is checked for make and break at the correct temperatures.
3. The detector temperature sensor is checked and calibrated.
4. The amplifier threshold count is adjusted and calibrated.
5. The azimuth servo is checked for position.
6. Detector bias voltages are checked.
7. The frequency of the audio tone is checked and adjusted if necessary.
8. The AGC module output is checked with the detector dark. Gain resistors adjusted if necessary.
9. Determination of NEFD is made, for each channel.
10. An amplifier threshold check is made for each channel.

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11. A check of all system test points is made.

Trouble Shooting and Repair

Trouble shooting and repair will be undertaken whenever the unit shows a fault by failing to pass the in-flight self-test or the flight-line tests. It shall be removed from the vehicle and taken to the laboratory where trouble shooting will locate the fault and repairs will be made. Subsequent to the repair and prior to installation back on the vehicle, the unit will be thoroughly bench tested and calibrated.

The Model J218 Test Equipment

The Model J218 test equipment will consist of a mobile test console and bench-mounted test equipment. The mobile test console will contain all the hardware required for the flight-line testing, including electronic test equipment and detector and electronic cooling systems. The mobile test console is a two-bay console, with 24 inches of vertical panel space in each bay. In addition, each bay has a top panel area, inclined at 35° from the vertical, for ease of viewing and operation. In this inclined panel area are mounted the control panel, the NLS 4206 digital voltmeter, and the accompanying TH-3 peak hold unit, on the righthand side. In the left top panel, also inclined at 35° from the horizontal, is mounted the Tektronix RM35A dual beam oscilloscope, with a Type 1A1 dual trace plug-in amplifier.

The control panel contains a duplication of the W80C control and display system including ON/OFF switch, self-test switch and light; left, center, and right field indicator lights, and a tone ON/OFF switch. Also on the control panel are a test mode switch, a voltmeter to monitor the 28 volts to the W80 servo amplifiers, and various test points.

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In the lefthand bay, beneath the RM35A oscilloscope, is located the detector cooler. Access is gained to the cooler through doors both in the front and rear of this compartment. The coolant utilized in the detector cooler is Freon-12, instrument grade. This is contained in a 10 lb. capacity cylindrical tank, sufficient for about 8 hours of continuous operation. A fill port is provided so that this tank may be replenished as required. A vent valve, made accessible to the operator, is required during the rechanging operation. An outlet port is provided from which coolant is supplied to the W80 unit under test. Finally an ON/OFF valve controls the flow of Freon to the outlet port. Driers, a check valve, and relief valve complete the detector cooling system.

The 28 volt power supply which supplies dc to the W80 during bench testing is also located in the bottom left side of the J218.

In the lower part of the righthand bay, taking up 14 inches of vertical panel space is the refrigerated air cooler. This is required to cool the internal W80C electronics when the W80 is enclosed and operating on the flight-line. A flow of 15 cubic feet of 39°F air per minute is supplied at a pressure of 1 inch of H_2O. Controls are provided on the control panel of the J218 to turn the unit on and off. The cold air connections to the W80 are made through the rear of the J218 mobile test console. This unit also dries the air which is being circulated through the W80C. So at the completion of flight-line tests after the air cooler is disconnected from the W80, the latter is sealed and purged of damp air. It can now be cooled as in operational use, without internal fogging or frosting.

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Also in the righthand bay of the J218 mobile test console below the inclined panel and above the air cooler is a 7 inch drawer with a hinged top writing surface. The drawer has a positive latch so that it will not work open during transportation. The cabinet doors all contain latches to hold them in a shut position. The test console is mounted on 10 inch semi-pneumatic castors, fixed at one end and swivelled at the other. Toe-operated clamps lock the two swivelled castors.

Provision is made in the rear of the unit for bringing in the following power sources:

1) 115 volts, 60 cps, single phase

2) 115 volts, 400 cps, single phase

One hundred foot lengths of line are supplied with the J218 for each of these power inputs.

A Simpson Model 269 multitester is included in the equipment complement of the J218 mobile test console. It is contained in its case when not in use and stored in the drawer.

The bench mounted test equipment which goes to make up the remainder of the J218 test equipment consists of "off-the-shelf" standard test equipment, and special test equipment. This bench mounted test equipment along with that mounted in the mobile test cart is required for the periodic bench testing and calibration of the W80C. The list of standard items in the bench mounted test equipment is as follows:

Item No.	Description	Manufacturer
1	Test chamber, T Jr.	Tenney Engineering
2	RMS voltmeter, 320	Ballantine
3	Microvolter, 546-C	General Radio

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Item No.	Description	Manufacturer
4	Oscillator, 200C	Hewlett-Packard
5	Counter, 522B	Hewlett-Packard
6	Power supply, 5015A	Power Designs
7	Prevision Resistor RB Dial, A Model	Helipot Div., Beckman

The special items required to fill the complement of J218 bend mounted test equipment are

1. Collimated test source
2. Temperature standard
3. Pulse generator

These are briefly described in the following paragraphs.

The collimated test source consists of a rotary indexing table, an off-axis spherical reflective collimator, a blackbody source and controller, and a common mounting base. The rotary table, collimator and blackbody are mounted on the common base, providing a package some 40 inches in length and weighing about 100 lbs. The blackbody controller (not mounted on the common base) measures 3-1/2 inches, by 19 inches, by 15 inches, and weighs 15 lbs.

The temperature standard, used to check the calibration of the detector temperature sensor is a bridge circuit in which the sensing element is a platinum resistance temperature probe. This probe will be a secondary temperature standard.

The pulse generator will simulate the outputs of the 100 preamplifier channels, where each individual output is a 5 millisecond, 20 volt pulse. These 100 outputs are fed into the digital package through the operational

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cabling normally connected to the preamp package output. A capability is provided in the pulse generator to simulate any number of good channels from 0 to 100, and in addition, any particular channel or group of particular channels.

Flight Line Testing with the J218

These tests are accomplished on the flight line, with the pod attached to the vehicle. The J218 mobile console is wheeled to the vehicle and positioned close by the W80C unit. Interconnecting cables and cooling lines are long enough to allow five feet of separation from the back of the J218 to the nose cone bulkhead. The freon container in the detector cooler should be fully charged. The W80 pod access doors are not opened, but the nose cone is removed and the pylon access door is open. The pod is connected to the vehicle through the interface connector through which both 115 volt 400 cps, and 28 V dc power is supplied to the W80C from the vehicle. The cockpit control and display panels are energized and connected to the W80.

The mobile test console is connected to a source of 60 cps, 115 volt, single phase power.

The pre-flight tests have already been listed. The are accomplished as follows:

1. Self-Test from Vehicle, and from J218

The test engineer connects the detector cooler to the appropriate fitting on the W80 forward bulkhead (available with the nose cone removed), and initiates detector cooling. He connects the refrigerated air cooler to the pod inlet on the top of the pod inside the pylon. The dessicator is removed from

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the pod air outlet on the forward bulkhead and the return air pipe to the cooler connected in. The air cooler is turned on. The test engineer then proceeds to the vehicle cockpit where he turns on the W80C system. He waits for 20 to 30 minutes to allow the detector array to cool, and initiates self-check from the vehicle. He then returns to the pod and the mobile test set. he connects the test connector on the W80 forward bulkhead to the J218, and initiates self-test from the J218 control panel.

2. <u>Power Supply Voltages</u>

The test engineer monitors the W80 28 volt servo supply on the meter on the control panel. He then turns the mode switch on the control panel and monitors the +36 volt and ±15 volt W80 supplies on the J218 digital voltmeter.

3. <u>Channel Count and Reference Level</u>

By switching the mode switch to channel count, and initiating self-test of the W80C, the test engineer will read out on the digital voltmeter a voltage which is a measure of the actual number of good channels. This can be compared with past channel counts on the same system in order to determine if additional channels have failed since the last check. The reference level is checked by turning the mode switch to the appropriate position and reading out on the digital voltmeter. This reading should not change, and corresponds to the channel count threshold level.

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4. Audio Tone and Contact Closures

The interlock over-ride button is pushed on the J218 control panel. This permits the tone to be activated and contact closures to be made during self-test. The engineer proceeds to the cockpit, initiates self-test and monitors the tone through the cockpit headset. Tone should be present for approximately 12 seconds, the same time duration for the indicator lamps. If the tone is too loud or too soft, it can be adjusted by a potentiometer on the W80 forward bulkhead.

Two sets of relay contacts, normally open, close during target acquisition, but are inhibited during self-test. The interlock override button on the J218 overcomes this inhibition. With this button still pushed, the engineer connects the Simpson 269 multitester to one set of relay contacts in the Q-bay of the vehicle. They should indicate open. He then initiates a self-test either from the J218 or the vehicle. The 269 should indicate contact closure for a period of some 12 seconds. This procedure will be repeated for the other set of relay contacts. Care should be taken that the relay contacts are disconnected from equipment or circuits during this test which might in any way be damaged by the internal battery in the Simpson 269.

5. Tone Level Adjustment

This can be performed here if it has not already been accomplished in Step 4.

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6. Scan Generator and Servo Response Time

The override switch on the J218 control panel is returned to normal. The test mode switch is turned to "first bar" position. Pulses are now supplied to the J218 from the W80 shift register, one corresponding to the first bar and one to the eighteenth bar. These are each 4 volt pulses of 278 milliseconds duration. The first bar is observed on the oscilloscope with the eighteenth bar triggering the sweep. The time duration between them is noted. This corresponds to one complete scan and will be approximately 5 seconds. The J218 mode switch is now turned to eighteenth bar. In this position the eighteenth bar pulse will be observed on the oscilloscope with the first bar being used to trigger the sweep. Frame time is again noted. This is the time for the forward scan or field, and should be the same as that for the reverse scan or field as previously observed.

The mode switch is now turned to "center field". This permits the shift register pulse from the first bar and the center field switch pulse to be monitored by the oscilloscope. The center field switch is actuated by mechanical movement of the azimuth servo. Thus the time duration between the first bar and the center field switch signal is equivalent to approximately half the frame time.

7. Dessicator Check

After completion of the above flight-line tests, the dessicator is checked visually, and the element changed if required.

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8. Visual Check

The J218 is disconnected from the pod. The air and freon cooling hoses are disconnected. The plastic plug is replaced in the air inlet port under the pylon, and the pylon door replaced. The dessicator is replaced in its proper position under the nose cone. The interface connector is checked for tightness. The nose cone is replaced. Machine screws are checked for tightness. The W80 is now ready for operational use.

Periodic Bench Testing With The J218

The periodic testing and calibration, or bench tests, will be performed on a bench in the laboratory on a periodic basis. The period between successive bench tests shall be two months until sufficient history has been built up to warrant a change in the period.

The pod is removed from the vehicle, and set in a cradle on the bench. The nose cone is removed. For self-test and other tests where the detector cooler is required, the access doors must be in place, and the refrigerated air cooler must be connected and operating. This keeps cool dry air circulating through the pod and prevents fogging and frosting on the detector array and optics. If the detector cooler is not required, the pod access doors can be removed and a blower used to cool the electronics. The W80 pod is connected to the J218 mobile test console through both the interface connector and the test connector. The J218 mobile test console is connected to a source of 60 cycle, 115 volts, single phase, and 400 cycle, 115 volts, single phase. Power is applied to the W80C through the J218 control panel.

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Tests performed on the W80 during periodic bench testing are as follows:

1. **Flight Line Testing Repeat**

This includes a self-check, a check of W80 power supply voltages and a check of channel count and reference level. For the self-check, the detector cooler will be utilized. The access doors will be in place and the air cooler connected and functioning. The remaining tests in Step 1 can be performed at ambient with the access doors removed and a blower used for cooling. The interlock override will be activated enabling audio tone and relay contact closures to be checked at the test point panel on the J218 control panel. The scan generator is checked with the oscilloscope. The dessicator check can be left until the end of the bench testing procedure.

2. **Heater blanket thermostat check**

For this test the scanner assembly is removed from the pod and placed in the Tenney Jr. test chamber. The reference platinum resistance probe is affixed to some metallic area on the telescope, as close to the location of the heater blanket thermostat as possible. The resistance probe/telescope interface should be coated lightly with silicone grease to ensure a good thermal contact. The probe can be held down temporarily with tape. The resistance probe leads should be brought out through the chamber connector to the temperature standard readout circuitry of the J218. The heater blanket in series

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with the thermostat is connected to the scanner interface connector. The appropriate pins are connected to leads through the chamber wall connector to the Simpson 269 multitester which will provide a continuity indication.

The chamber is then cooled until the thermostat "makes", and the temperature noted. The chamber is then allowed to warm, and the temperature is again noted when the thermostat "breaks". Make and break temperatures should fall within the range of -17 to -23°C. If they do not, the thermostat should be adjusted.

3. Detector temperature sensor calibration check

The detector temperature sensor is a platinum resistance probe. For this test the scanner is situated in the cold box but is connected to the pod through an adaptor cable which does not provide power to the heater blanket. Thus the detector temperature probe is connected normally to the digital package. The reference probe is affixed to the detector heat sink and brought out as before to the temperature readout equipment in the J218.

The detector temperature sensor yields a GO or a NO-GO condition depending upon the temperature of the detector heat sink. With the sensor indicating a GO condition, two voltages will be observed at test points in the digital package. When the detector heat sink temperature is too cold or too warm, only one of these voltage levels will be present. By varying the temperature of

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the cold box, the temperature limits of the sensor GO condition will be determined. The actual temperatures corresponding to these limits as determined by the reference probe will be determined. They should be 15°± 1°C and -25°± 1°C. If the temperature limits do not agree with these limits, adjustments can be made in the digital package.

4. Amplifier Threshold Count and Calibration

For this test the J218 special pulse generator is connected to the digital package in the W80 pod through the input connectors which normally connect to the amplifiers. The pulse generator simulates the pulses out of the level detectors of all the channels. Controls on the pulse generator can cause the number of simultaneous output pulses to be anywhere from 0 to 100, and from any channel or group of channels required.

The threshold voltage is measured on the digital voltmeter as the number of input pulses is varied. Correlation with previous data is checked. The pulses in the input are increased until triggering is achieved. The number of pulses to achieve triggering should be 90. If it takes more or less than 90 pulses to achieve triggering, then the digital circuit can be adjusted for the correct threshold. If the self-test does not produce enough pulses to cause triggering, then the W80 unit will be sent to maintenance where amplifiers will be checked and/or the detector array changed.

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5. Servo Position Check

For this test the quartz dome is removed. Power is applied to the W80C unit and the alignment of the azimuth pointer with the azimuth fiducial marks are observed, during scanning. If realignment is indicated this is accomplished by adjusting the azimuth alignment potentiometers in the servo package.

6. Detector Bias Voltage Check

Since this test must be performed with the doors removed from the pod, then the detector array cannot be cooled. The bias obtained is a function of detector temperature, and at common laboratory temperatures ($75^{\circ}F \pm 10^{\circ}F$) should be in the range from 1-1/2 to 2-1/2 volts.

The covers are removed from all amplifier packages. With power applied to the W80 unit, detector bias is checked for all channels with the digital voltmeter, at test points in the amplifier packages. If the bias value for any particular channel falls outside the given range, and if in addition, the sensitivity of that channel is low, the bias resistor may be changed so as to correct the bias, with the chance of restoring sensitivity.

7. Audio Tone Frequency Check and Adjustment

Audio tone level was already bench checked in Step 1. This test could be run at the same time if convenient or at this stage in bench testing. With the unit operating the interlock

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override on the J218 control panel is activated, and the self-test button pushed. This puts the tone signal at the J218 test point panel. The oscilloscope is connected to the test points and audio tone frequency is observed. The frequence adjustment is located in the digital package and should provide a range from 667 to 1334 cps or greater. The frequency should be adjusted to 1000 cps or other frequency as desired.

8. <u>AGC Module Check</u>

For this test the detector array does not have to be cooled but should be shielded from all light (the W80 dome protector can be installed over the dome). The Ballantine 320, rms voltmeter, is used to measure the output of the AGC module of each channel in turn. These test points are located in the amplifier packages, under the can covers. The rms noise voltage measured at each such test point should fall within the range from 0.35 to 0.45 volts. If the noise voltage does not fall in this range, then the channel microcircuit amplifier should be changed, until one is obtained with an AGC output in the required range. If necessary, the gain resistor can be changed in order to get the desired AGC output.

9. <u>Determination of NEFD</u>

The noise equivalent flux density (NEFD) of each channel of the W80C is computed from the signal measured at the AGC output resulting from an input signal of known irradiance or flux density. Thus.....

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$$\text{NEFD} = H \frac{E_N}{E_S} = \frac{H}{S/N}$$

Where H is the irradiance in W/cm^2, in the 2.85 to 3.0 micron band. E_N is the rms noise voltage measured in Step 8 "AGC Module Check", and E_S is the peak signal amplitude resulting from H, and measured at the AGC output on the oscilloscope or peak reading voltmeter.

Ideally for this test, the detector array should be cooled. However, since this leads to condensation of water and frosting on the telescope optical elements, the test must be performed with the detector array at ambient.

The NEFD which can be expected with the detector at ambient will be greater (or poorer) than that expected under cooled conditions. The degradation factor can be determined by referring to the paper "Optimum Utilization of Lead Sulphide Infrared Detectors Under Diverse Operating Conditions."* Figure 16 of the reference indicates a degradation of 2.25 in D* at 3300 cps when changing operating temperature from -20°C to +25°C. This applies to response at 2.7 microns. Figure 9 gives the relationship between response at 2.7 and 2.93 where the W80 operates. In changing spectral operating point from 2.7 to 2.93 microns at -20°C, relative response drops by a factor of about 1.6. With the temperature at +25°C, the relative

* by J. N. Humphrey, Applied Optics, Vol. 4, No. 6, pp 665-675, June, 1965

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response drops by a factor of 2.7. So by working at 2.93 microns, we can expect D* to be worse by a factor of 2.7/1.6 = 1.7 over the degradation to be encountered at 2.7 microns. So overall degradation factor is 2.25 x 1.7 = 3.8.

For this test the collimated test source must be set up to present a target to the W80 system. The W80 is designed to bring such a target to a focus on the detector with the telescope cold. To correct for this either the shim must be removed from the telescope or the collimator must be defocussed by a known amount. The latter will normally be much easier to accomplish. The blackbody temperature, aperture size and filter are selected to produce a flux density about 4 times as great as the minimum target signal, or $4 \times 4.7 \times 10^{-12}$ W/cm^2 or approximately 2×10^{-11} W/cm^2.

The procedure for determining NEFD is as follows:

1. The rms AGC output voltage is noted with no signal input. These measurements were taken in Test No. 8.
2. The blackbody source is set up to give a S/N of approximately 10, as determined by using the negative peak signal observed at the AGC output, and comparing it with the rms noise of Step 1. The negative pulse is used due to non-linear AGC action on the positive pulse.
3. Approximately 50 readings of negative peak signal are observed. The median value is selected and used to make a final determination of S/N.

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4. NEFD is now determined using the expression

$$NEFD = \frac{H}{S/N}$$

where H is the irradiance in W/cm^2 in the 2.85 to 3.0 micron band. This can be determined from a knowledge of blackbody temperature, aperture size, filter transmission characteristic, collimator speed (f/10), optical efficiency of the collimator (assumed to be 0.81 at 3 microns), atmospheric transmission (assume to be 0.8), and collimator primary area.

10. Amplifier Threshold Check

A threshold to rms noise ratio of 6.7 or greater is required to maintain the false alarm interval greater than 10 hours. To allow for inherent inaccuracies a value of 8 to 1 is used in establishing this threshold.

The following proceedure is used to check channel threshold levels.

1. An irradiance level is set up with the J218 blackbody test source which will provide a S/N of 8 to 8.5 as observed at the AGC output, using the negative pulse. Since the aperture size and filter are fixed, irradiance level is varied by changing the blackbody temperature. Another method would be to move the detector element slightly away from the garget image.

2. With a counter connected to the level detector output of the channel under test, the number of triggers per 100

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scans are determined. If the count falls in the range of 40 to 50, the threshold adjustment is satisfactory. If the count falls outside this range the following steps are taken.

3. Both threshold potentiometers are backed off, alternately, one turn at a time, until no triggering occurs as observed on a counter connected to the output of the level detector.

4. The negative threshold pot is now adjusted to provide 20 to 25 triggers per 100 scans. Subsequently, the positive threshold pot is adjusted to provide a total of 40 to 50 triggers per 100 scans, from both positive and negative threshold exceedences.

5. The W80 dome is now covered so that the detector is dark. No threshold exceedences should occur. If they do, further trouble shooting is indicated.

6. With all channel thresholds properly adjusted, the common amplifier output is observed with the detector dark. All channels should be quiet and no pulse observed.

11. Final Self-Test

At the conclusion of bench testing with the W80 still connected to the J218, the access doors are reinstalled. The dessicator is removed from the nose cone bulkhead, checked, and the element replaced if necessary. The refrigerated air cooler is connected to the W80 and turned on. The detector

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cooler is connected and turned on. After 20 to 30 minutes, self-test is initiated.

With a successful self-test the power is turned off. The W80 is disconnected from the J218, the dessicator is fixed in place and the nose cone installed. The plastic cover is inserted in the air inlet port. The pylon door is put back in place. The unit is now ready to be reinstalled in the vehicle.

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-1-2510 L Nro. #25
Copy 1 of 3
Enclosure 1
30 June 65
CJC-65001

ADDENDA

W80 Search Set and TR11 Tracking Rangefinder

I. GENERAL

Certain changes in the design characteristics of the W80/TR11 equipments are desirable to facilitate installation in existing aircraft. In particular, every effort must be made to reduce size, weight and power consumption, consistent with maintaining performance goals, reliability and maintainability. Trade-offs with the various performance characteristics and overall cost are desired. Reductions in weight and dome or window size requirements have been achieved for the TR11 Tracking Rangefinder. A detailed discussion of the proposed changes to the submitted design is given in the following sections of this addenda. These changes will provide a search/track system design with the following characteristics:

1. W80 Search Set

a. NEFD - 1×10^{-12} w/cm^2

b. S/N ratio - 10:1 (at maximum range)

c. Weight - 18 lb (including coolant supply)

d. Power consumption - 50 watts.

2. TR11 Tracking Rangefinder

a. Tracker

(1) NEFD - 2×10^{-13} w/cm^2

(2) S/N ratio - 50:1 (at maximum range)

(3) Weight - 10 lb

(4) Power consumption - 50 watts

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b. Laser Rangefinder

(1) Transmitter aperture - 24 mm

(2) Beam width - 0.33 millirad

(3) Laser output - 0.1 joules

(4) Target range - 15 n mi

(5) Receiver aperture - 3-in., 39% blocking

(6) Weight - 25 lb, plus 8 lb for cooling system

(7) Power consumption: 300 w pk, 60 w ave

3. Control Subsystem

a. Weight - 20 lb

b. Power consumption: 400 w pk, 120 w ave

4. Computer

a. Weight - 4 lb

b. Power consumption, 5 watts

5. Total Weight - 85 lb

6. Total power - 805 w pk, 285 w ave.

II. WEIGHT REDUCTION

The proposed weight reductions result from a strong emphasis on light-weight materials and packaging designs. Magnesium structural parts will be used in lieu of steel or aluminum wherever possible. Electronic packaging

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designs will also utilize magnesium frameworks. The additional costs incurred as a result of this approach will amount to approximately 20% of fabrication labor costs, and 5-10% of raw material costs. These costs are included in the pricing data submitted with the proposal.

III. SIZE REDUCTION

A modified gimbal arrangement will be utilized for the TR11 that will provide a greatly reduced window viewing area. A layout of this approach is shown in Figure 1. The configuration utilizes a gimballed mirror with a stationary tracker rangefinder. The smaller gimballed mass provides three distinct advantages. The volume required to allow for movement of the gimballed element is reduced, the size of the window required to provide an unobstructed 55° x 60° FOV to the TR11 is reduced, and the servo power required to drive the mirror is reduced substantially over the gimballed TR11. This latter effect is due in part to the reduced mass but, also to the fact that the electrical and cooling lines required for the TR11 are now stationary and do not add unbalance torques that the servo must overcome.

A. EFFECT ON W80 DESIGN

The previous design utilized the azimuth gimbal as the inner gimbal for the W80 Search Set in order to minimize the inertia for the high scan rates. The azimuth axis of the TR11 was also placed on the inner gimbal to simplify the handoff procedure by providing the same position coordinates for both systems. With the gimballed mirror approach, the overall size and complexity of the TR11 is eased considerably if the azimuth rotation is placed on the outer gimbal. This necessitates reversing the gimbal arrangement on the W80 to conform. This will result in a larger inertia in azimuth, therefore a larger torquer is required to obtain the same dynamic performance. The larger torquer requirement, however, is more than offset by the gains made by the new TR11 configuration.

The gimbal and torquer drive arrangement for the W80 will be very similar to the TR11 shown in Figure 1. A sketch of the revised W80

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installation is shown in Figure 2. It will use essentially the same window arrangement as the TR11, but will be slightly smaller as noted.

B. EFFECT ON SERVO DESIGN

Gimballing the tracker mirror in the proposed configuration results in several modifications to the previously proposed control system. The proposed programmer, however, will remain the same since the sequence and logic of search, acquisition and track are unaffected by this modification.

The TR11's control scheme is modified in both the follow-up and track modes. In the follow-up mode where the tracker gimbals are slaved to the search set gimbals, a device is needed in the elevation servo to compensate for the angle doubling effect of the mirror. This compensation can be realized by either gearing the position transducer by a two-to-one ratio or by purchasing a special purpose transducer to double the angle through its electrical windings. The latter alternative is favored since it eliminates the need for gears with associated back lash problems. The azimuth angular position is unaffected since the gimbal revolves around the optical axis.

In the track mode other effects are present in the gimballed mirror configuration which are not present in the previous system. Cross coupling of the error signal between azimuth and elevation results when the optical axis is parallel to azimuth axis. This effect can be eliminated by proper processing of the error signal. One technique would be to modify the phase of the reference signal used in the synchronous demodulation. The amount of phase shift would be a function of the azimuth angular position and could be mechanized by mechanically coupling a resolver to the azimuth axis.

A second order cross-coupling effect is present but will not result in significant tracking error since its magnitude is proportional to the sine of the off-axis displacement. For the small tracker field-of-view required, the error is negligible.

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The proposed tracker servo is based upon existing designs that have proven tracking accuracies of 0.1 millirad (total lag) for the maximum line of sight rates and accelerations expected.

C. TR11 RECEIVER

The reduction of allowable tracking lag error from 0.25 to 0.1 mrad permits two changes in the TR11 receiver. The aperture diameter is reduced from 3.75 inches to 3.0 inches and the beam width is reduced from 0.7 mrad to 0.5 mrad. The reduction in the transmitter beam width to 0.33 mrad - as discussed below - combined with the 0.1 mrad maximum tracking error permits an increase in the expected return power. In the original TR11 proposal a power reduction factor of 1/3 was applied for a 0.25 mrad error and the 0.5 mrad beam width. Since a 0.1 mrad error in a .33 mrad beam permits operation nearer the center of the beam, 2/3 of the 1/e factor can be retrieved. This factor of 1.8 combined with the factor of 2 reduction in noise $(\frac{.7}{.5})^2$ from the reduced receiver beam width more than offsets the 3.75 to 3.0 inch receiver aperture.

IV. POWER REDUCTIONS

The reduction in TR11 transmitting beam width allows the use of a smaller laser beam width than the originally proposed 0.5 millirad (with correspondingly lower power output required) and still guarantee a range return pulse under conditions of maximum target maneuver. A reduced beam width can be obtained either by increasing the transmitter aperture, or reducing the ruby rod diameter. Investigations have indicated that a 4 mm dia. rod will be suitable for this application, providing a minification factor of 6 with the 24 mm aperture and a beam width of 0.33 millirad. This reduction in beam width allows the power in the output pulse to be reduced by the factor $(\frac{.33}{.5})^2$, or a reduction from 0.25 joules to 0.1 joules.

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The power required for the control system will also be reduced. As previously discussed, lower torques exist for the TRW gimballed mirror during acquisition and track due to reduction in mass and mass unbalances. Also, low power components will be substituted for many control elements such as relays, operational amplifiers, etc, to reduce the steady state power drain on the system. The cost of these components will increase somewhat over those previously proposed, however, these costs are included in the pricing data supplied.

V. <u>HIGH VOLTAGE PROTECTION</u> (ADDENDA TO SECTION II.A,2,c(3)

The laser power supply contains a high voltage (2 kv) high current flashlamp supply. In order to prevent arcing at altitudes above 40,000 ft, pressurization of certain portions of the power supply and the flashlamp cavity, to an equivalent 40,000 ft. altitude, will be provided.

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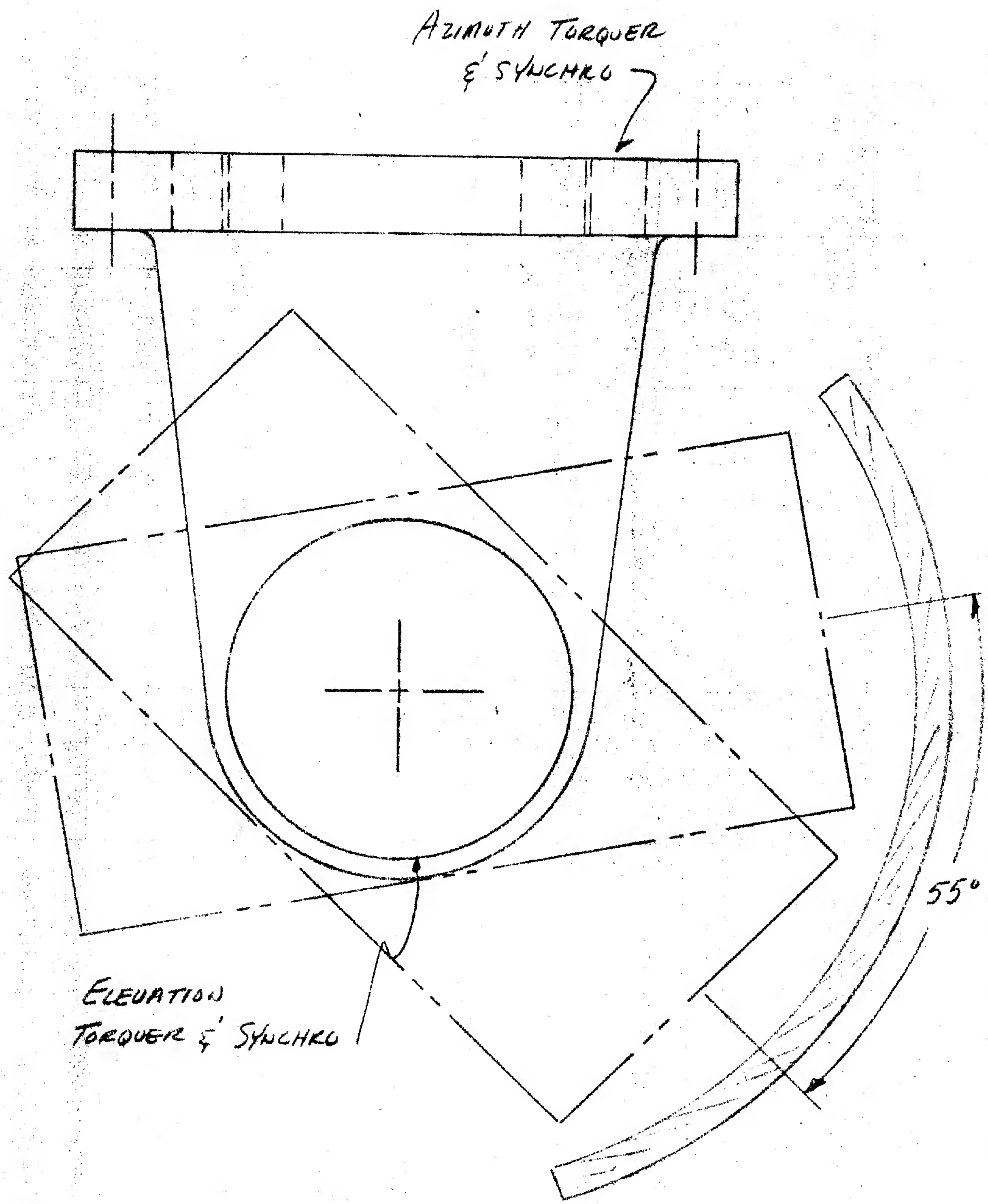

W80 INSTALLATION MODIF.

FIG 2

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No. # 19-I
Copy 1

File
Aerosol
+ XP

10 December 1965

Dear Frank:

As requested in your letter of 1 December 1965, the following information is being forwarded:

A. Contract Number
FH-2515

B. Actual cum Contractor Expenditures as of 31 Oct 1965
$113,642

C. Outstanding Contractor Commitments as of 31 Oct 1965
$231,646

D. Estimated Contractor Expenditures for the Two Months Period, 1 Nov through 31 December 1965
$260,000 November actual $146,818
December estimated $113,182

E. Estimated Contractor Outstanding Commitments as of 31 Dec 1965
$491,000

F. Estimated Contractor Commitments as of 30 June 1966
$210,000

G. Estimated Contractor Commitments as of 30 June 1966
$701,000

H. For Contracts which will not be completed by 30 June 1966, an Estimate of the Contractor's Additional Costs to Complete for the Period Beyond 30 June 1966. (Based Upon Presently Approved Contract Scope, whether fully Definitized or not.)
$ -0-

The actuals are based upon the committed overhead rate. See my note on the other Contract. Also note that G is about $30,000 over the Contract estimated cost. This is based on about $15,000 additional scope already reported to you and an estimate that there will probably be another $15,000 before things settle down.

Very truly yours,

STAT

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File Aerojet FH-2515 xxP

1 December 1965

STAT

Dear [redacted]

For overall Mid-Year funding and review purposes, I have been requested to obtain from you a special contract/fiscal report containing the following information for each contract we have with your firm, i.e., Contract No. FH-2510 and FH-2515:

A. Contract Number

B. Actual cum contractor expenditures as of 31 October 1965.

C. Outstanding contractor commitments as of 31 October 1965.

D. Estimated contractor expenditures for the two months period, 1 November through 31 December 1965.

E. Estimated contractor outstanding commitments as of 31 December 1965.

F. Estimated contractor expenditures for the period 1 January through 30 June 1966.

G. Estimated contractor commitments as of 30 June 1966.

H. For contracts which will not be completed by 30 June 1966, an estimate of the contractor's additional costs to complete for the period beyond 30 June 1966. (Based upon presently approved contract scope, whether fully definitized or not.)

I have also been advised that this report is needed no later than 10 December 1965, and your cooperation with respect to this special one-time report is appreciated.

If you have any questions, please call me.

Best Regards,

STAT

[redacted]

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SECRET

[redacted] 25X1

Rec - 12/1/65

18 November 1965 JMH

MEMORANDUM TO: All Negotiators

FROM : Contracting Officer

SUBJECT : Special Mid-Year Contract Fiscal Report

1. D/Contracts will issue a Special Contract Fiscal Report as of 31 December 1965 showing Program funding status as of mid-year, and projected to year-end, FY-66.

2. Negotiators will be responsible for:

a. Transmittal of cable requests to contractors following the attached format. (Note: With regard to BEIGE and any other contractors who report program data separately, the negotiators should arrange for the total figures to be broken down by individual program amounts. In these instances, the attached cable format should be modified accordingly. (Also, negotiators should perform the necessary internal liaison to preclude sending two cables to the same contractor).

b. Critical review of contractor replies for contracts for which they are responsible.

c. Resolve any questions regarding data submitted by contractors before passing to the fiscal section.

d. Endorse the contractor replies to indicate the data are satisfactory for entry in the D/Contracts fiscal records. (Adjustments to contractor data, where necessary, should be made by the negotiator.)

e. Follow up overdue submissions (not received by close-of-business, 3 December).

3. Cooperation of the entire staff in furnishing the management of the various organizational components serviced by D/Contracts with a first quality report on a timely basis will be appreciated.

[redacted] 25X1

CH/CD/OSA

SECRET

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FORM 1-63 1120 EDITIONS

MFR. 4-64

Remove Protective Sheet Before Typing Cable or Amending Text

CLASSIFIED MESSAGE

S E C R E T

ORIG : :eml
UNIT : CD/OSA
25X1 EXT :
DATE: 18 NOVEMBER 1965

ROUTING			
1	CD/OSA	9	25X1
2	AD/OSA	10	
3	D/TECH	11	
4	D/FA	12	
5	PS/OSA	13	
6	BFB/OSA	14	
7	SD/OSA	15	
8	RB/OSA	16	

PRECEDENCE				
	DEFERRED	X	PRIORITY	INITIALS
	ROUTINE		OPERATIONAL IMMEDIATE	INITIALS

TO :

FROM:

CONF:

INFO :

TO INFO CITE

1. FOR MID-YEAR FUNDING REVIEW PURPOSES, IT IS ESSENTIAL THAT THE ADIC CONTRACTING OFFICER BE FURNISHED A SPECIAL CONTRACT/FISCAL REPORT CONTAINING THE FOLLOWING INFORMATION FOR EACH CONTRACT, OR CONTRACT TASK ORDER, (OTHER THAN FIRM FIXED PRICE). THE DATA ARE TO BE FURNISHED IRRESPECTIVE OF ANY OTHER PERIODIC SUBMISSIONS MADE BY THE CONTRACTOR. THE INFORMATION SHOULD BE SUBMITTED BY CABLE AT THE EARLIEST FEASIBLE DATE, BUT IN ANY EVENT NOT LATER THAN 5 DECEMBER 1965. AMOUNTS ARE TO BE SHOWN IN THOUSANDS OF DOLLARS. ESTIMATES ARE TO BE THE MOST REALISTIC POSSIBLE. THE APPLICABLE PORTION OF PROFIT OR FEE SHOULD BE INCLUDED IN THE ESTIMATE FOR EXPENDITURE SHOWN FOR EACH PERIOD (SUB-PARAGRAPHS B,D,F AND H BELOW) IN ORDER TO REFLECT TOTAL FUNDING REQUIREMENTS.

(A). CONTRACT NUMBER, (AND ~~TASK~~ ORDER NUMBER, WHERE APPLICABLE).

(B). ACTUAL CUM CONTRACTOR EXPENDITURES AS OF 31 OCTOBER 1965.

COORDINATING OFFICERS

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Sanitized Copy Approved for Release 2010/05/19 : CIA-RDP72B00464R000100110001-2

FORM 12C USE PREVIOUS EDITIONS

Remove Protective Sheet Before Typing Cable or Amending Text

CLASSIFIED MESSAGE

SECRET

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TO :
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7		15	
8		16	

PRECEDENCE: DEFERRED | PRIORITY | INITIALS
ROUTINE | OPERATIONAL IMMEDIATE | INITIALS

INFO CITE

(C). OUTSTANDING CONTRACTOR COMMITMENTS AS OF 31 OCTOBER 1965.

(D). ESTIMATED CONTRACTOR EXPENDITURES FOR THE TWO MONTHS PERIOD, 1 NOVEMBER THROUGH 31 DECEMBER 1965.

(E). ESTIMATED CONTRACTOR OUTSTANDING COMMITMENTS AS OF 31 DECEMBER 1965.

(F). ESTIMATED CONTRACTOR EXPENDITURES FOR THE PERIOD 1 JANUARY THROUGH 30 JUNE 1966.

(G). ESTIMATED CONTRACTOR COMMITMENTS AS OF 30 JUNE 1966.

(H). FOR CONTRACTS WHICH WILL NOT BE COMPLETED BY 30 JUNE 1966, AN ESTIMATE OF THE CONTRACTOR'S ADDITIONAL COSTS TO COMPLETE FOR THE PERIOD BEYOND 30 JUNE 1966. (BASED UPON PRESENTLY APPROVED CONTRACT SCOPE, WHETHER FULLY DEFINITIZED OR NOT).

2. THE INFORMATION IS TO BE UNIFORMLY LISTED IN ACCORDANCE WITH THE ABOVE ARRANGEMENT. ONLY THE AMOUNTS ARE TO BE ENTERED FOR EACH

COORDINATING OFFICERS

SECRET

GROUP 1 Excluded from automatic

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FORM 4-63 12C Sanitized Copy Approved for Release 2010/05/19 : CIA-RDP72B00464R000100110001-2 MFR. 4-64 (44)
Remove Protective Sheet Before Typing Cable or Amending Text

CLASSIFIED MESSAGE

SECRET

ORIG :
UNIT :
EXT :
DATE:

ROUTING			
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8		16	

PRECEDENCE			
	DEFERRED	PRIORITY	INITIALS
	ROUTINE	OPERATIONAL IMMEDIATE	INITIALS

TO :

FROM:

CONF:

INFO :

TO INFO CITE

APPLICABLE LETTER (B THRU H) IN THE ABOVE LIST; IT IS NOT NECESSARY WHEN REPLYING TO REPEAT THE ABOVE INFORMATION.

3. REPLIES ARE TO REFERENCE THIS CABLE. YOUR COOPERATION IS APPRECIATED.

END OF MESSAGE

COORDINATING OFFICERS

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